

JVC

SERVICE MANUAL

COMPACT DISC PLAYER

MODEL XL-V400B



COMPACT
disc
DIGITAL AUDIO

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Safety Precautions

1. The design of this product contains special hardware, many circuits and components specially for safety purposes.

For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.

2. Alterations of the design or circuitry of the product should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the product have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. Electrical components having such features are identified by shading on the schematics and by (Δ) on the parts list in Service manual. The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list in Service manual may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and/or the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard.

When servicing is required, the original lead routing and dress should be observed, and they should be confirmed to be returned to normal after re-assembling.

5. Leakage current check

(Safety for electrical shock hazard)

After re-assembling the product, always perform an isolation check on the exposed metal parts of the product (antenna terminals, knobs, metal cabinet, screw heads, headphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

Do not use a line isolation transformer during this check.

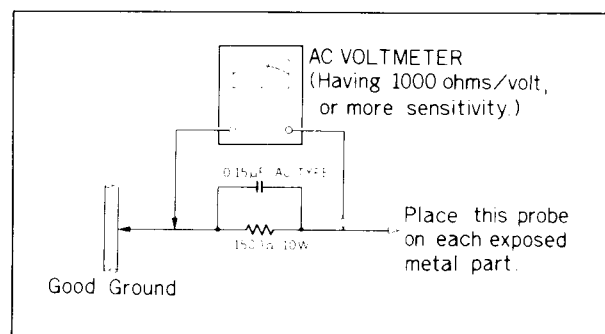
- Plug the AC line cord directly into the AC outlet. Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good ground. Any leakage current must not exceed 0.5 mA AC (r.m.s.).

- Alternate check method

Plug the AC line cord directly into the AC outlet. Use an AC voltmeter having 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1500 Ω 10 W resistor paralleled by a 0.15 μ F AC-type capacitor between an exposed metal part and a known good ground.

Measure the AC voltage across the resistor with the AC voltmeter.

Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75 V AC (r.m.s.). This corresponds to 0.5 mA AC (r.m.s.).



CHECKING YOUR LINE VOLTAGE (Except for U.S.A., Canada, Australia, U.K. and Continental Europe.)

Before inserting the power plug, please check this setting to see that it corresponds with the line voltage in your area. If it doesn't, be sure to adjust the voltage selector switch to the proper setting before operating this equipment. The voltage selector switch is located on the bottom board.

CAUTION Before selecting the "Voltage selector switch" to proper voltage disconnect the power plug.



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SERVICE MANUAL

COMPACT DISC PLAYER

MODEL **XL-V400B**

SUPPLEMENT

This supplement to the Service Manual for the Model XL-V400B is published to cover alterations gradually taken in production of the series for the purpose of giving the unit a greater efficiency and improving productivity as well as reducing the cost of production.

Concerning maintenance of pickup, the procedure was modified.

Maintenance of Laser Pickup

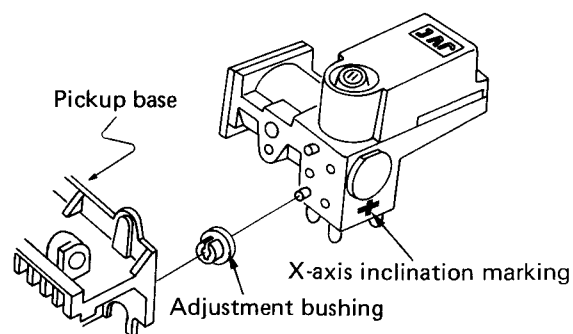
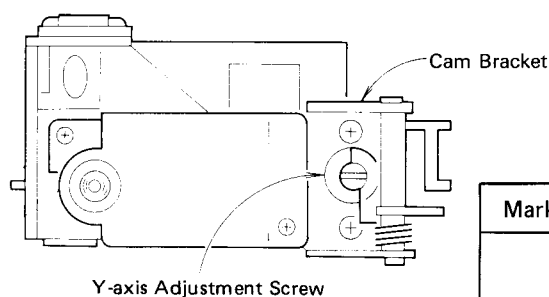
1. Service life of the laser pickup

- 1) Turn the power on after connecting IC802 pin ① of the front PCB (ENN-027-2) to GND.
- 2) Measure the laser power with the laser power meter.
- 3) Measure the EFM output if a laser power meter is not available.
- 4) When the measured value is as shown in the table below, replace the pickup because the service life of the laser diode is judged as having expired.

Measurement value	Measurement instrument	Measured value
Laser power	Laser power meter	Less than 0.3mV
EFM output (Amplitude of eye pattern)	Oscilloscope	Less than 1.0V

- 5) When replacing the pickup, it is recommended to preset the Y-axis adjustment screw at the position shown in the figure below.

When installing the pickup base, refer to the x-axis inclination mark on the side of the laser pickup assembly and then to the corresponding figure below to determine how the adjustment bushing should be oriented.



Marking	-	0	+
Adjustment bushing inclination angle			

- 6) Replace according to the flow chart of pickup replacement.

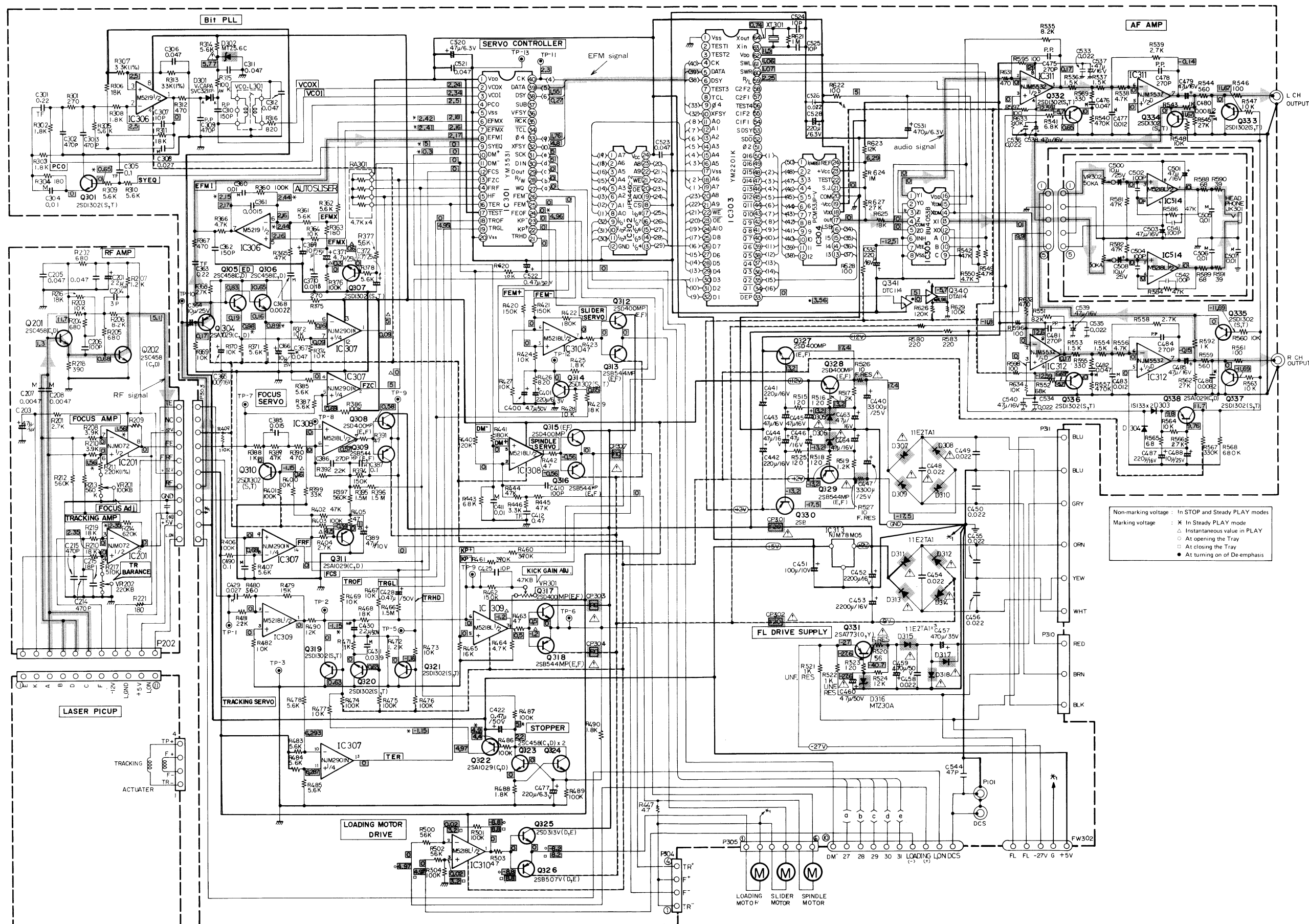
2. Semifixed resistor on the APC board

The semifixed resistor on the APC board installed with the pickup is for the laser power adjustment. Do not touch the semifixed resistor because this adjustment should be performed as part of a pair of adjustments to match the characteristics of the optical block.

If the laser power is too low, replace the pickup because the service life of the laser diode has expired.

Turning the semifixed resistor for a normal pickup may damage the pickup because of overcurrent.

16-(1) Main Section



ENN-027-3

ENN-028-1

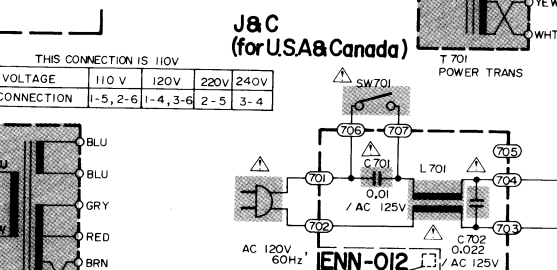
ENN-027-21

ENN-028

VOLTAGE SELECTOR

COMPONENT LIST:

- 25C458(C,D) DT114YNT
- 25D400MPE(F) 25B544MPE(F)
- 25D333V(I,E) 25B507V(I,E)
- 3VC321P-AW
- YM2201K μPD7519CW-209
- μPD511ACU-607
- YM3531
- μPD446C-2 PCM53JP-V
- Q201, Q202, Q301, Q304, Q305, Q306, Q307, Q310, Q311, Q314, Q319, Q320, Q321, Q322, Q323, Q324, Q331, Q332, Q333, Q334, Q335, Q336, Q337, Q338, Q340, Q341, Q801, Q802, Q803, Q804, Q805, Q806
- Q308, Q309, Q312, Q313, Q315, Q316, Q317, Q318, Q327, Q328, Q329, Q330
- Q325, Q326
- D301
- D801, D802, D803, D804, D805, D806, D807, D808, D809, D815, Q302, Q303, Q306, Q336
- D307, D308, Q309, D310, Q311, Q312, Q313, Q314, D315, Q317, Q318
- CP301, CP302, CP303, CP304, CP307
- DB18
- DB10, DB11, DB12, DB13, DB14
- DB17
- BU40538 (NJM2901N)
- NJM55320 NJM072
- M5219 M5218L
- μPC1473HA
- IC305 (16PIN) IC307 (14PIN)
- IC201 IC311 IC312
- IC306, IC308, IC309 IC310, IC314
- IC804



- Notes:**
1.  shows DC voltage to the chassis with no signal input.
 2.  indicates positive B power supply.
 3.  indicates negative B power supply.
 4.  indicates signal path.
 5. When replacing the parts in the darkened area () and those marked with , be sure to use the designated parts to ensure safety.
 6. This is the standard circuit diagram.
The design and contents are subject to change without notice.

Pickup replacement procedure

Unplug the power cord from an AC outlet after checking that the power switch is off.

Disconnect the connectors of the old pickup and loosen the screw fixing it to the pickup base to remove it.

Install a new pickup to the pickup base and connect the two connectors positively.

Plug in the power cord and check that the objective lens moves up and down at the same time as the laser for about 8 sec. after the power switch turned on.

The laser emission should be approx. 0.4 mW when it is measured by the laser power meter. (EFM Output $2 \pm 0.5V$)

Note: Do not look directly at the laser beam.

Play a disc and connect TP ② to GND when the disc starts to rotate. In this case, it does not matter if the display shows 1--.--.

Perform the grating adjustment following the specified adjustment method. In this case, it is not necessary to check by moving the pickup to the outer edge.

Perform the tracking offset adjustment.

Disconnect TP ② from GND and check that the waveform of the eye pattern can be observed.

Perform the Y-axis adjustment.

Perform the focus offset adjustment.

check that TOC is read when switching from OPEN to CLOSE.

YES

Playback around the center between the inner and outer edges of a disc.

Perform the grating adjustment.

Perform the tracking offset adjustment.

Perform the Y-axis adjustment.

Perform the focus offset adjustment.

Perform the tracking offset adjustment.

Perform the kick gain adjustment.

Is the disc played correctly when switching STOP to PLAY?

YES

Is the SKIP function normal? (About 3—5 sec. from the inner to outer edge)

YES

Replacement completed.

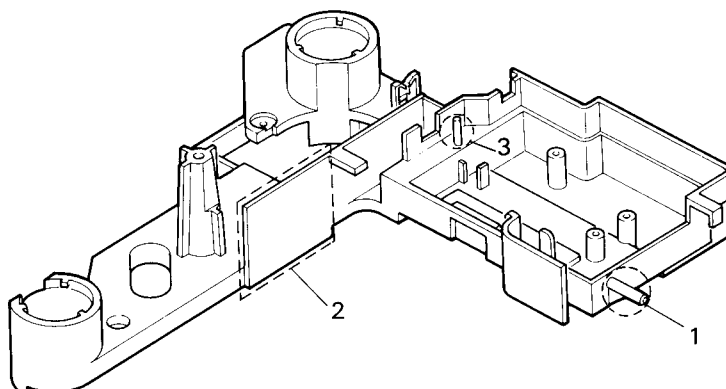
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NO

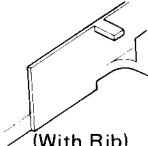
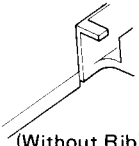
NO

Comparison Chart of Old & New Parts

• Stard (R)



How to distinguish new and old Stand (R)

	Modified Part	Old	New
1	Boss for inserting to Rear Panel	 (Round Boss)	 (Oval Boss)
2	Rib for holding Transf. Wire	 (With Rib)	 (Without Rib)
3	Wrapping Part Rib for holding Wire	 (Round Boss)	 (Oval Boss)

The Marks for Designated Areas

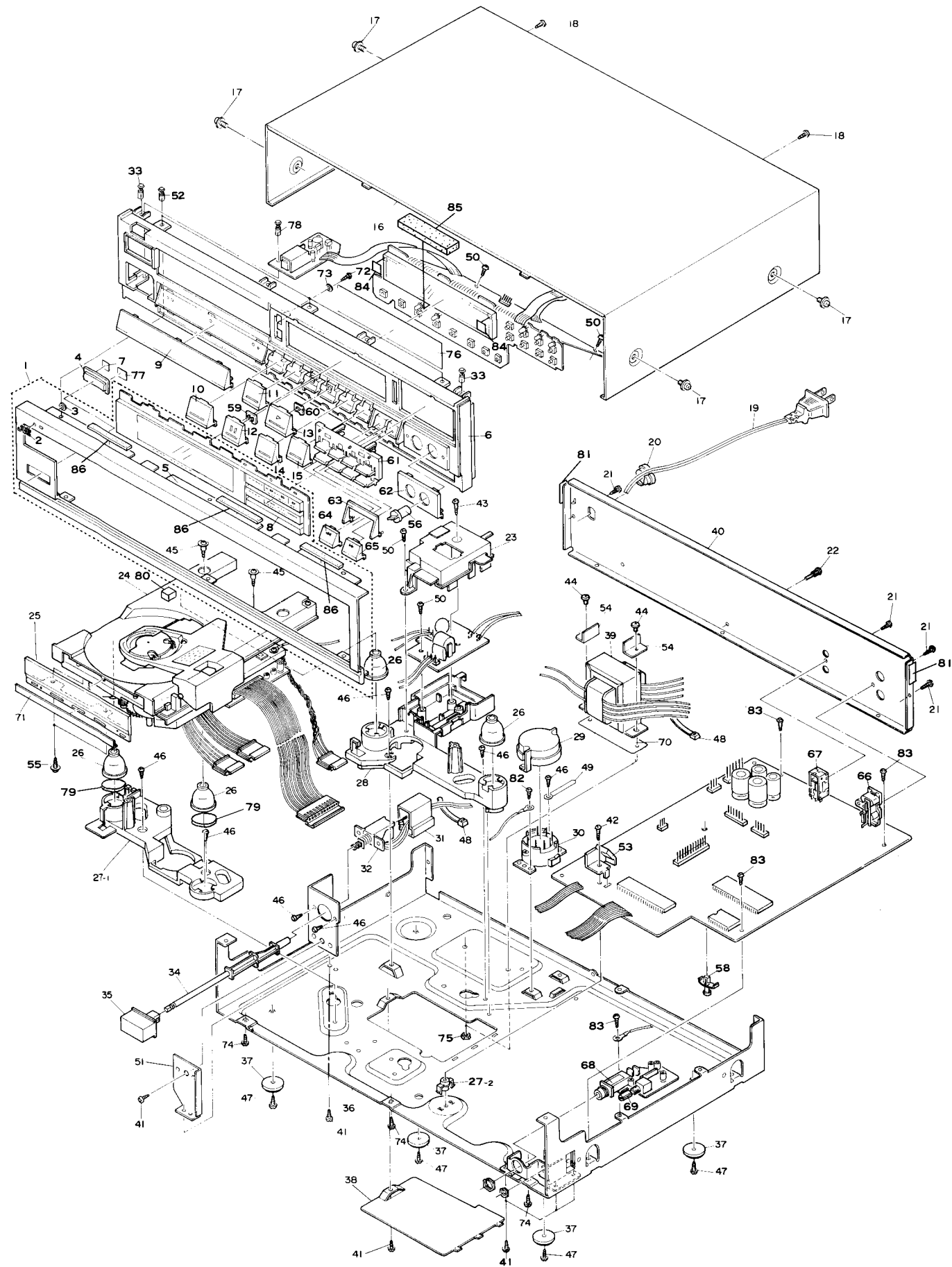
J U.S.A.
 C Canada
 E Europe
 A Australia
 G West Germany
 ES Spain
 BS U.K.
 P, PG . . . U.S. Military Market
 U Other Countries
 No mark indicates all areas.

* Old Stand (R) can be fitted in New Rear Panel but
New Stand (R) cannot be fitted in Old Rear Panel.

• Difference List

Old	New	Areas
E11157-001	E11157-003	Except J, C
E11157-002	E11157-004	J, C

Exploded View and Parts List



The parts marked are modified and added.

Item No.	Part Number	Part Name	Q'ty	Description	Areas
1	EFP-XLV400BE	Front Panel Ass'y	1		
2	E70913-001	JVC Mark	1		
3	E60912-003	Speed Nut	1		
4	E72411-001	Window Screen	1		
5	E25090-003	Front Panel	1		
6	E11168-001	Front Base	1		
7	E70140-007	Sheet	1		
8	E303858-001	Window Screen	1		
9	E303861-001	Cap	1		
10	E303862-001	Cap	1	OPEN/CLOSE	
11	E303862-002	Cap	1	STOP	
12	E303862-003	Cap	1	PAUSE	
13	E303862-004	Cap	1	PLAY	
14	E303862-005	Cap	1	SKIP ◀	
15	E303862-006	Cap	1	SKIP ▶	
16	E25076-001	Metal Cover	1		
17	E61660-004	Screw	4		
18	SHSB3008M	Screw	2		
19	QMP1200-200	Power Cord	1		J, C U, P, PG
19	QMP7600-250	Power Cord	1		
20	QMP3900-200	Power Cord	1		E, G, ES A
20	QMP2560-244	Power Cord	1		BS
20	QMP9017-008BS	Power Cord	1		Except BS
20	QHS3876-162	Cord Stopper	1		BS
20	QHS3876-162BS	Cord Stopper	1		
21	SBSE3008M	Screw	4		
22	E66052-001	Screw	1		
23	E303842-001	Cover	1		Except J, C J, C
23	E303842-002	Cover	1		
24	See Page 8.	Mechanism Base Unit	1		
25	E303867-003	Tray Panel	1		
26	E72393-001	FL. Rubber	4		
27-1	E25081-001A	Stand (F)	1		
27-2	E25081-002B	C.B. Holder	1		
28	See Page 4.	Stand (R)	1		Except J, C
29	E302764-001	Voltage Selector Cover	1		U, P, PG
30	QSR0085-008U	Voltage Selector	1		U, P, PG
31	E71004-001	Switch Cover	1		
32	QSP1106-004	Power Switch	1		Except BS
32	QSP1106-004BS	Power Switch	1		BS
33	E48729-007	Plastic Rivet	2		
34	E303854-001	Push Shaft	1		
35	E72355-003	Push Knob	1		
36	E11151-003	Chassis Base	1		Except U, P, PG
36	E11151-004	Chassis Base	1		U, P, PG
37	E47227-026	Foot	4		
38	E303841-002	Bottom Cover	1		
39	ETP1020-12JA	Power Transformer	1		J, C
39	ETP1020-12MA	Power Transformer	1		U, P, PG
39	ETP1020-12EA	Power Transformer	1		E, A, G, ES
39	ETP1020-12EABS	Power Transformer	1		BS
40	E25078-005	Rear Panel	1		J
40	E25078-006	Rear Panel	1		Except J
41	SBSE3008N	Screw	6		
42	SBST3016Z	Screw	1		
43	SBSF3014Z	Screw	1		

The Marks for Designated Areas

J U.S.A.
C Canada
E Europe
A Australia
G West Germany
ES . . . Spain
BS . . . U.K.
P, PG . . U.S. Military Market
U Other Countries

No mark indicates all areas.

⚠: Safety Parts.

The parts marked are modified and added.

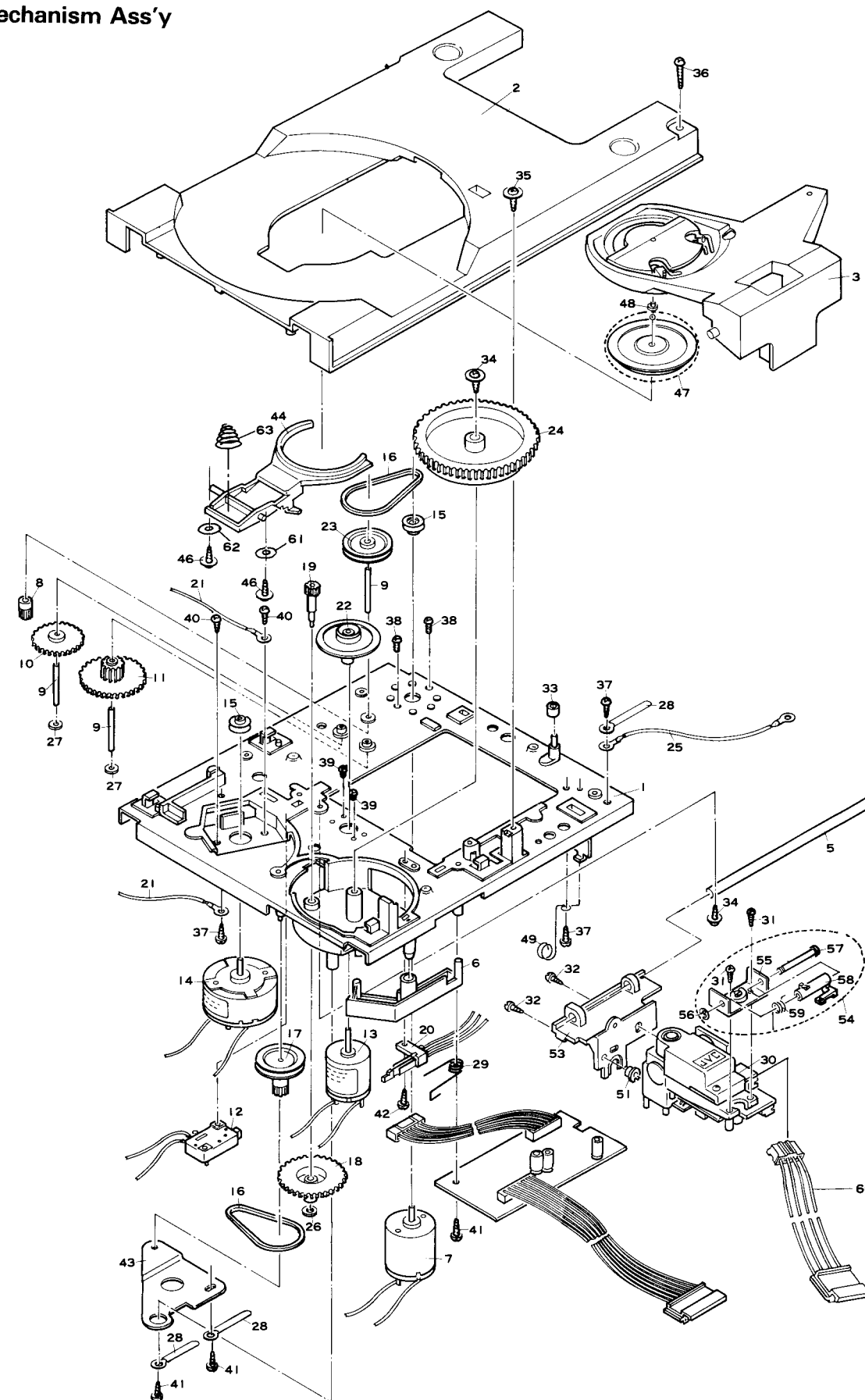
△	Item No.	Part Number	Part Name	Q'ty	Description	Areas
	44	E65389-006	Ass'y Screw	2		
	45	E72404-002	Ass'y Screw	2		
	46	SBST3006Z	Screw	7		
	47	SDSB3008N	Screw	4		
	48	E33754-001	Tie Band	2		
	49	E72018-001	Wire Clamp	1		
	50	SBSF3008Z	Screw	4		
	51	E72576-001	Bracket	1		
	52	E48729-009	Plastic Rivet	3		
	53	E72415-001	Holder	1		
	54	E72606-001	Trans. Bracket	2		
	55	E72405-001	Screw	2		
	56	E72431-001	Knob	1		
	57	Elimination	—	—		
	58	E69384-002	Fastener	1		
	59	E72413-001	Indicator	1		
	60	E72414-001	Indicator	1		
	61	E303860-001	Push Button	1		
	62	E303865-001	Cap	1		
	63	E303863-001	Cap	1	SEARCH	
	64	E303864-001	Cap	1	SEARCH ◀◀	
	65	E303864-002	Cap	1	SEARCH ▶▶	
	66	Elimination	—	—		
	67	Elimination	—	—		
	68	Elimination	—	—		
	69	Elimination	—	—		
	70	E72945-001	Sheet Ass'y	1		
	71	E72418-001	PS Panel	1		
	72	GBSF3008Z	Screw	1		
	73	E71769-001	Washer	1		
	74	SDSB3008M	Screw	3		
	75	NTS4000Z	Nut	2		
	76	E303868-002	FL Screen	1		
	77	E72116-001	Screen	1		
	78	E48729-008	Plastic Rivet	1		
	79	E72634-002	Spacer	2		
	80	E72572-001	Spacer	1		
	81	E72572-005	Spacer	2		
	82	SBST3006CC	Screw	1		
	83	SBSE3008CC	Screw	4		
	84	E72323-001	Spacer	2		
	85	EXO100006H05S	Spacer	1		
	86	EXO032005N50S	Spacer	3		

△: Safety Parts

The Marks for Designated Areas

J U.S.A.
 C Canada
 E Europe
 A Australia
 G West Germany
 ES Spain
 BS U.K.
 P, PG . . . U.S. Military Market
 U Other Countries
 No mark indicates all areas.

• Mechanism Ass'y



The parts marked are modified and added.

	Item No.	Part Number	Part Name	Q'ty	Description	Areas
	1	E11148-004	Base Ass'y	1		
	2	E11149-001	Tray	1		
	3	E25068-002	Holder	1		
	4	Elimination	—	—		
	5	E71742-002	Feed Shaft	1		
	6	E303831-002	Lever	1		
	7	RF-260T-08450	Motor	1		
	8	E71733-002	Feed Gear (A)	1		
	9	E71731-002	Shaft	3		
	10	E71734-002	Feed Gear (B)	1		
	11	E303542-002	Feed Gear (C)	1		
	12	OSS1214-002	Slide Push Switch	1		
	13	VA612R53	Motor	1		
	14	E71569-001	Motor	1		
	15	E72376-001	M. Pulley	2		
	16	E69879-002	Belt	2		
	17	E72375-001	Pulley (A)	1		
	18	E72377-003	Gear (Y)	1		
	19	E72378-001	Gear (X)	1		
	20	ESB1200-001	Leaf Switch	1		
	21	EWT021-017	Terminal Wire Ass'y	1		
	22	E72379-001	Turn Table	1		
	23	E72392-001	Pulley (B)	1		
	24	E25064-003	Main Gear	1		
	25	EWT021-018	Terminal Wire Ass'y	1		
	26	E60912-001	Speed Nut	1		
	27	E72024-001	Speed Nut	2		
	28	E50670-005	Wire Clamp	3		
	29	E72382-001	Tor Spring	1		
	30	OPTIMA-1	Laser Pick Up Ass'y	1		
	31	SPSP2605N	Screw	2		
	32	SDSP2605N	Screw	2		
	33	E70267-003	R. Tube	1		
	34	E65923-003	Screw	2		
	35	E65923-004	Screw	1		
	36	SBSF3014Z	Screw	1		
	37	SBSE3008CC	Screw	3		
	38	E72963-268	Screw	2		
	39	E72963-203	Screw	2		
	40	SDSP2604N	Screw	2		
	41	SBSF3008Z	Screw	3		
	42	SPSF2608Z	Screw	1		
	43	E72624-001	Gear Bracket	1		
	44	E303832-003	Lifter	1		
	45	Elimination	—	—		
	46	E72405-001	Special Screw	2		
	47	E72380-004	Clamper Ass'y	1		
	48	E72408-001	Spacer	1		
	49	E72562-001	Wire Holder	1		
	50	Elimination	—	—		
	51	E72432-001	Adjust Bushing	1		
	52	Elimination	Tube Spacer	—		
	53	E25097-001	P.U. Base (O)	1		
	54	E72409-003	Cam Bracket Unit	1		
	55	E72372-002	Cam Bracket Ass'y	1		
	56	REE1500X	E-Ring	1		
	57	E72386-002	Shaft	1		
	58	E72374-002	Adjust Lever	1		
	59	E72397-001	Spring	1		
	60	EWS00Z-003	Socket Wire Ass'y	1		
	61	O03093-834	Washer	1	t = 0.13	
	62	O03093-827	Washer	1	t = 0.25	
	63	E72728-001	Spring	1		

The Marks for Designated Areas

J U.S.A.
 C Canada
 E Europe
 A Australia
 G West Germany
 ES . . . Spain
 BS . . . U.K.
 P,PG . . U.S. Military Market
 U Other Countries

No mark indicates all areas.

Packing

• Difference List

Part Name	Old	New	Areas
Packing Case	PK-XLV400BE (E24872-007)	PK-XLV400BE(2) (E24872-016)	Except ES
	PK-XLV400BES (E24872-008)	PK-XLV400BES(2) (E24872-017)	ES only
Packing Pad (Front) (Rear)	NZ-XLV400BE (E11197-003, E11197-005)	NZ-XLV400BE(2) (E11197-006, E11197-007)	

JVC

VICTOR COMPANY OF JAPAN, LIMITED

STEREO DIVISION, YAMATO PLANT, 1644, Shimotsuruma, Yamato-shi, Kanagawa-ken, 242, JAPAN

Laser Caution

1. **CLASS 1 LASER PRODUCT**
2. **DANGER:** Invisible laser radiation when open and interlock failed or defeated. Avoid direct exposure to beam.
3. **CAUTION:** Do not open the top cover. There are no user serviceable parts inside the unit; leave all servicing to qualified service personnel.
4. **CAUTION:** The compact disc player uses invisible laser radiation and is equipped with safety switches which prevent emission of radiation when the drawer is open and the safety interlocks have failed or are defeated. It is dangerous to defeat the safety switches.
5. **CAUTION:** Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
6. **CAUTION:** The laser is able to function, if safety switches are out of function. The laser light is invisible, avoid exposure, do not disassemble the laser unit, but replace the complete unit.

VARNING: OSYNLIG LASERSTRÅLNING UPPSTÅR VID KOMPONENTENS ÖPPNING NÄR SÄKERHETSBRYTAREN ÄR FRÅNSLAGEN.

VAROITUS: VARMUUSKYTKIMEN OLLESSA POIS PÄÄLTÄ KUN LAITE AVATAAN, SIELLÄ KEHITTYY NÄKYMÄTÖNTÄ LASERSÄTEILYÄ. ÄLÄ PANE ITSEÄSI SÄTEILYN ALTIIKSI.

ADVARSEL: USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSafbrydere er ude af funktion. UNDGÅ UDSÆTTELSE FOR STRÅLING.

ADVARSEL: USYNLIG LASERSTRÅLING VED ÅPNING NÅR SIKKERHETSBRYTAREN ER AVSLOTT. UNNGÅ UTSETTELSE FOR STRÅLING.

(FOR U.S.A. ONLY)

LASER CAUTION LABEL

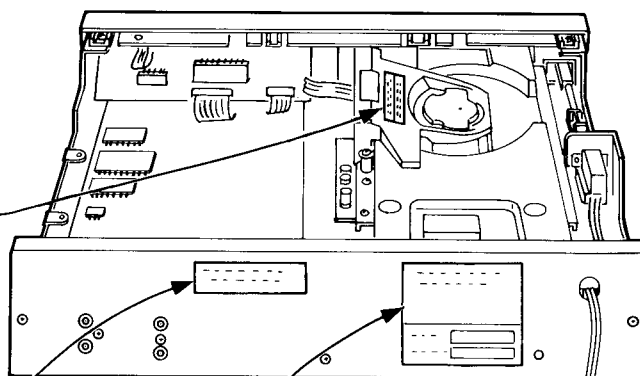
DANGER — Invisible laser radiation when open and interlock failed or defeated. AVOID DIRECT EXPOSURE TO BEAM

(LABEL LOCATED INSIDE THE UNIT —DO NOT OPEN)

CERTIFICATION LABEL

CERTIFICATION
THIS PRODUCT COMPLIES WITH DHHS RULES
21 CFR SUBCHAPTER J APPLICABLE AT DATE
OF MANUFACTURE.

(PRINTED ON THE REAR PANEL)



IDENTIFICATION LABEL

JVC MODEL NO. XL-V400B
COMPACT DISC PLAYER
AC 120 V ~ 60 Hz 22 W

US JVC CORP.
41 SLATER DRIVE ELMWOOD PARK,
N.J. 07407
MANUFACTURED AT Y.P.
MADE IN JAPAN

MANUFACTURED *1

SERIAL NO. *2

NOTE

- (*1) : STAMP THE DATE OF MANUFACTURE
(*2) : STAMP THE SERIAL PRODUCTION NUMBER

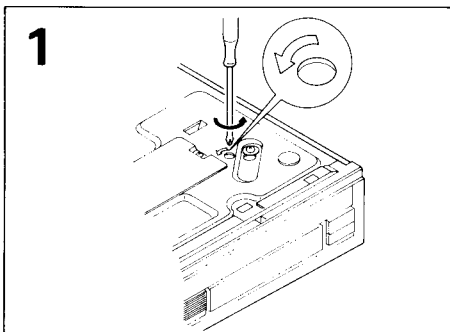
1. Specifications

System	: Compact disc player
Signal detection system	: Non-contact optical system pickup
Number of channels	: 2 channels
Frequency response	: 5 Hz — 20,000 Hz
Dynamic range	: 94 dB (1 kHz)
Signal/noise ratio	: 95 dB (at digital 0)
Channel separation	: 90 dB (1 kHz)
Total harmonic distortion	: 0.003% (1 kHz)
Wow and flutter	: Less than measurable limit
Output level	: 2.0 Vrms (full scale)
Number of program steps	: 15 steps
Weight	: 5.9 kg (13 lbs.)
Dimensions	: 435(W) x 92(H) x 296(D) mm (17-3/16" x 3-5/8" x 11-11/16")
Accessory	: Signal cord 1 Remote cable (1 m) 1 Remote control unit (RM-V400U) 1 Battery (AA, R6, UM-3) 2

POWER SPECIFICATIONS

Areas	Line Voltage & Frequency	Power Consumption
U.S.A.	AC 120 V~, 60 Hz	22 watts
Canada		
Continental Europe	AC 220 V~, 50 Hz	
U.K.	AC 240 V~, 50 Hz	
Australia		
Other areas	AC 110/120/220/240 V~ selectable, 50/60 Hz	

2. Before Use

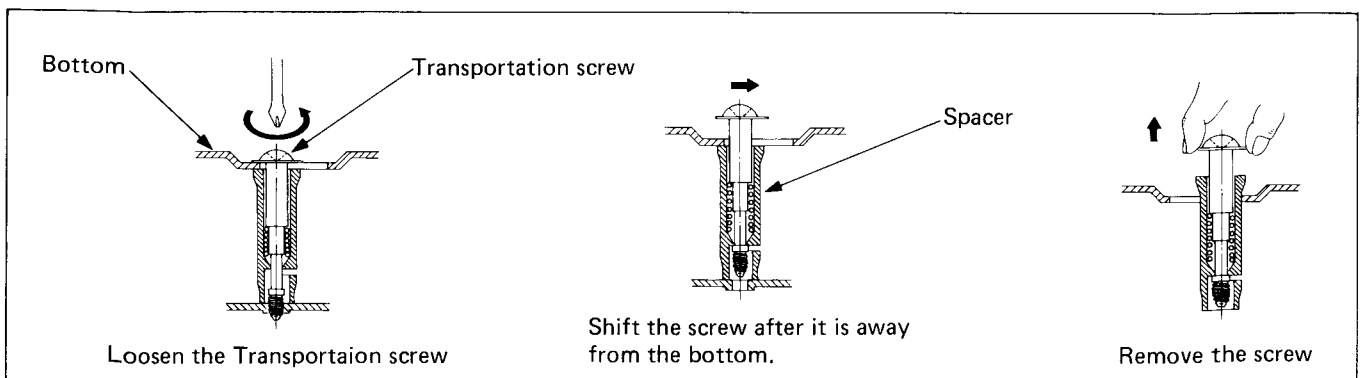
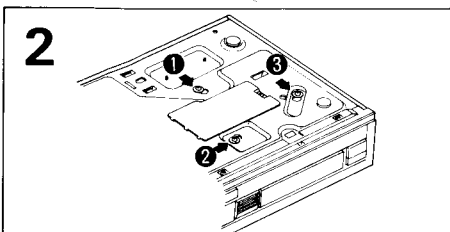


Do not insert power plug to the receptacle until completion of all the preparations.

1. Insert + driver into the hole with arrow "↺" and turn it counter-clockwise to the end (turn about 180°) to remove the transportation lock for laser pick-up.
2. Remove transportation screw ❶ through ❸ with spacers.

Note:

- Be sure to keep the transportation screws.
- Be sure to prepare for shipment according to the procedures opposite to the above.



3. Precaution in Use

- **Installation**
 - Select a place which is level, dry and **neither too cold nor too hot (between 5°C (41°F) and 35°C (95°F))**.
 - Avoid a dusty place or a place subject to vibrations.
- **Power**
 - When unplugging from the wall outlet, always pull the plug, not the power cord.
- **Malfunctions, etc.**
 - Do not insert any metallic object inside the player.
- The discs to be played on this player are limited to those bearing the mark on the left.
- **Volume setting**

As compact disc causes almost no noise, it is difficult to set the volume level by listening to noise as in the case of setting it for an ordinary analog turntable or a tape deck. If the volume level is raised too much because the beginning of the tune is quiet, the speakers may be damaged by a sudden increase of output.
- Placing something else other than a compact disc on the disc platter may cause the player to malfunction.
- If something goes wrong, turn the power off immediately. If the same phenomenon occurs when the power is turned on again, turn the power off and consult your JVC dealer.
- **Condensation**

As the compact disc player uses optical parts, for example, a lens, etc., moving it from a cold to warm place or using it in a room subject to excessive humidity or in a room where the fire has just been lit may cause condensation on the optical parts. This phenomenon may prevent the light from being correctly transmitted, and may cause noise or malfunction.

If dew condenses and the player does not function correctly, leave it for several hours with the power turned on.

If the player does not function even after such a period, consult your dealer.

5. Index Points on Compact Disc

Certain compact discs have index points which help the location of movements or parts of symphonies, etc. Set the tune number and index point from the jacket on which the index points are shown.

(Example)

- **Beethoven's fifth symphony in C minor, op. 67**

T No. (Tune number)	TRACK INFORMATION (Contents)	TRK T.	A.T.	INDEX (Number and contents)
1	The first movement Allegro con brio	00:00 07:18	00:02 07:20	1. 1st Theme (00:00) 2. 2nd Theme (00:46) 3. Development (02:50) 4. Recapitulation (04:11) 5. Coda (05:46)
2	The second movement Andante con moto	00:00 09:38	07:23 17:01	1. 1st Theme (00:00) 2. 2nd Theme (00:55) 3. 1st Variation (02:03) 4. 2nd Variation (03:55) 5. 3rd Variation (07:08) 6. Coda (08:60)

(The rest is omitted.)

4. How to Handle a Compact Disc

Since compact discs are plastic, they are easily damaged; if they get dirty, dusty, damaged or warped, the signal will not be picked up correctly, and such discs may cause the player to malfunction.

When using a compact disc, take care of the following points.

- Do not touch the surface to be played (reflective siver i.e. the side without the label) when playing or handling the discs.
- **Storage**

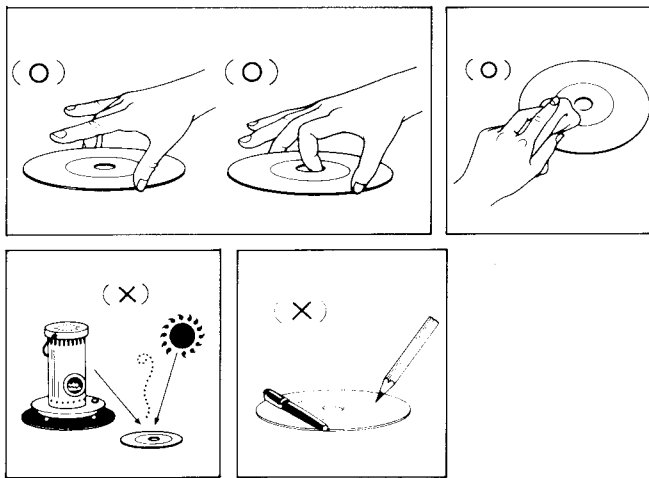
Make sure to keep discs in their cases.

If discs are piled on top of one another without cases, they may be damaged. Do not put discs in a place exposed to direct sunlight or in a place with high temperature and humidity.

Especially, avoid leaving discs in your car.
- **Maintenance of discs**

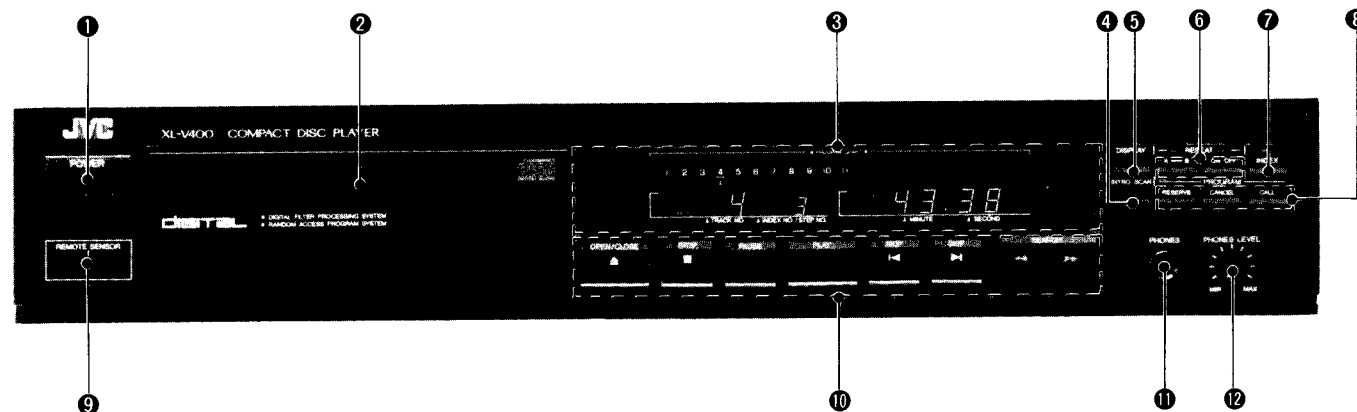
When fingerprints and dirt adhere to a disc, wipe off with a soft and dry cloth.

If it is difficult to clean, wipe off with a cloth moistened with water.
- Do not use analog record cleaners, benzine, alcohol or antistatic agent.
- Do not damage the label side or stick paper or adhesive tape to it.



6. Description and Functions

6-(1) Front Section



1 POWER button

Press this button to turn the power on, the display shown "1 0000". Press again to switch the power off, and the display goes off.

2 Disc platter

Load the disc to be played.

Note:

- While the disc platter is moving in or out, do not turn the power off or push or pull the disc platter by hands etc. because a malfunction may occur.

3 Display window (MULTI MODE DISPLAY)

This shows the total number of tunes on the disc, the total playing time, the elapsed playing time, the remaining playing time, various program data, etc. For more details, see "DISPLAY" on page 19.

4 INTRO-SCAN

Pressing this button plays the start of each tune for about 15 seconds in order or in programmed order when play is programmed.

Press the [SKIP] button to play the desired tune when you hear it during intro-scan; the intro-scan function is released and play starts from the start of the tune.

5 DISPLAY

Each time this button is pressed, the display is changed between two modes; [EACH] (elapsed time of each tune) ↔ [REMAIN] (remaining time).

6 REPEAT

ON OFF : Press for repeat play of all the tunes on a disc or programmed tunes. The indicator over this button lights. To release this function, press it again; the indicator goes out.

A ↔ B : Press in the play or pause mode if you want part of a disc to be played repeatedly. Press it at the point you want repeat play to start and the indicator over this button starts to flicker then press again at the point where repeat play is to stop; the indicator lights and repeat play of this part starts. At the same time as the indicator changes from flickering to lighting, the [ON OFF] indicator lights. To release this function, press the [A ↔ B] button again or the [ON OFF] button.

7 INDEX

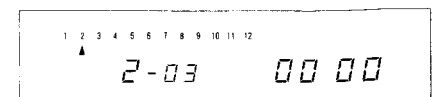
To set the index number, press this button and set the index number with the [SKIP] or [TRACK/INDEX NO.] buttons. The [TRACK/INDEX NO.] button is on the remote control unit.

The index number is shown in the INDEX NO./STEP NO. section of the display window.

If play is programmed, setting the index number is impossible.

(Example)

- When setting to index 3 of the second tune.



8 PROGRAM

RESERVE : Press to program the selected tunes by the [SKIP ◀▶] buttons or the [TRACK/INDEX NO.] buttons. A maximum of 15 tunes can be programmed.

Note:

When programming, press the [STOP ■] button. Because programming is possible only in the standby mode.

CANCEL : To erase programmed tunes, press this button in the standby mode. The tunes following the displayed one are erased in order.

CALL : To check the programmed tunes, press this button in the standby mode. Every time this is pressed, a tune number and its programmed order are shown in the display window.

Note:

- Holding the [CANCEL] or [CALL] button pressed changes the display continuously.

9 REMOTE SENSOR

This indicator lights when an infrared signal from the remote control unit is received.

10 Operation buttons

OPEN/CLOSE ▲ : Press to move the disc platter in and out. Press once and the disc platter will move out; now load a disc and press again to move the platter back in. The disc is now ready to be played.

If it is pressed during play, play is interrupted, the program is erased from memory and the disc platter comes out.

STOP ■ : Press to stop play.

PAUSE ■■ : Press to suspend play temporarily; the optical pickup stops and the disc continues to rotate. This status is called the pause mode.

PLAY ▶ : Press to start play.

If disc platter is out; press this button, then disc platter moves in and play starts (without pressing the [OPEN/CLOSE ▲] button).

SKIP ◀ : Press to return the pickup to the start of the tune being played or the previous tune during play.

Pressing this button during play moves the pickup to the start of the current tune.

After this, every time it is pressed momentarily, the pickup skips back by one tune. Holding it pressed moves the pickup back continuously.

SKIP ▶ : Press to move the pickup to the start of the next tune. Every time this button is pressed, the pickup skips forward by one tune. Holding it pressed moves the pickup forward continuously.

SEARCH ◀◀ : Press to move the pickup back quickly in the play or pause mode.

▶▶ : Press to move the pickup forward quickly in the play or pause mode.

11 PHONES

Insert the headphones plug into this jack.

12 PHONES LEVEL

Adjust the headphones volume level with this knob.

Note:

- Set the volume to an optimum level so as not to hurt your ears.

INDEX POINTS ON COMPACT DISCS

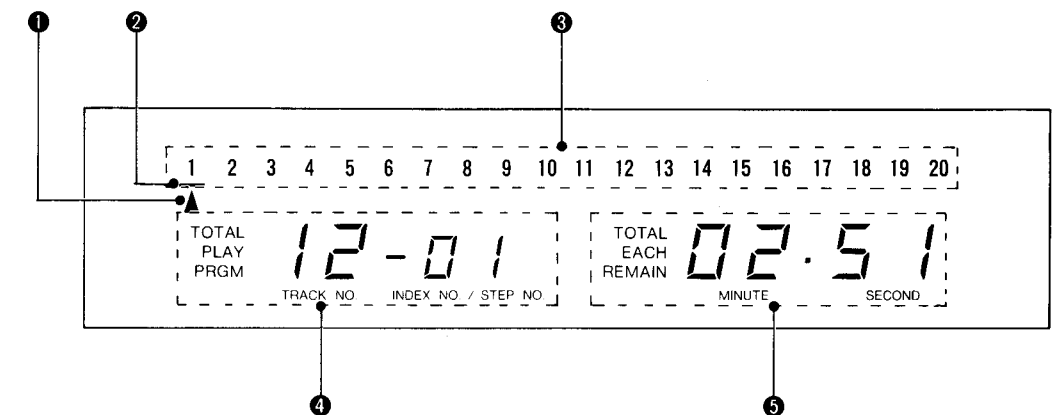
Certain compact discs have index points which help the location of movements or parts of symphonies, etc. Set the tune number and index point from the jacket on which the index points are shown.

(Example)

- Beethoven's fifth symphony in C minor, op. 67

T. No. (Tune number)	TRACK INFORMATION (Contents)	TRK T.	A.T.	INDEX (Number and contents)
1	The first movement Allegro con brio	00 00 07 18	00 02 07 20	1 1st Theme (00 00) 2 2nd Theme (00 46) 3 Development (02 50) 4 Recapitulation (04 11) 5 Coda (05 46)
2	The second movement Andante con moto	00 00 09 38	07 23 17 01	1 1st Theme (00 00) 2 2nd Theme (00 50) 3 1st Variation (02 03) 4 2nd Variation (03 55) 5 3rd Variation (07 08) 6 Coda (08 00)

(The rest is omitted.)

6-(2) Display Section**1 ▲ mark**

This mark lights under the tune to be played. Use when scanning or programming tunes.

2 — mark

This mark lights to show the number has been programmed using the [RESERVE] button.

3 Program chart

When a disc is loaded, the total number of tunes on the disc is indicated by the chart. If there are more than 20 tunes, all indicators light and the total number of tunes is shown by the TRACK NO.

4 Track/index indicator

TOTAL : Lights when the total number of tunes on the disc is shown.

PLAY : Lights when a disc is being played.

PRGM : Lights when tunes are programmed.

TRACK NO. : The total number of tunes, programmed tune numbers as well as the number of what is being played are digitally displayed.

INDEX NO./ : The index number or the number of tunes programmed is displayed.

me indicator

TOTAL : Lights when the total playing time of the programmed tunes is shown.

EACH : Lights when the elapsed playing time of the tune being played is shown.

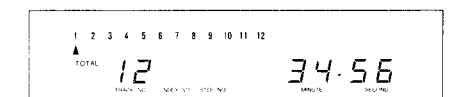
REMAIN : Lights when the remaining playing time of the disc is shown.

MINUTE : The total playing time, elapsed playing time or remaining playing time is displayed in minutes.

SECOND : The total playing time, elapsed playing time or remaining playing time is displayed in seconds.

Example of indications

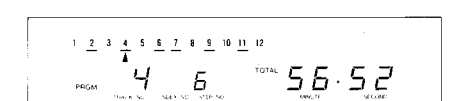
- When the total playing time of a disc with 12 tunes is 34 minutes 56 seconds.



- When the remaining time is 32 minutes 34 seconds when the second tune is playing.



- When the fourth tune is programmed sixth and the total playing time is 56 minutes 52 seconds.



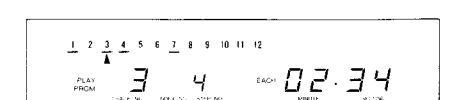
- When 1 minute 23 seconds has elapsed with the first tune playing.



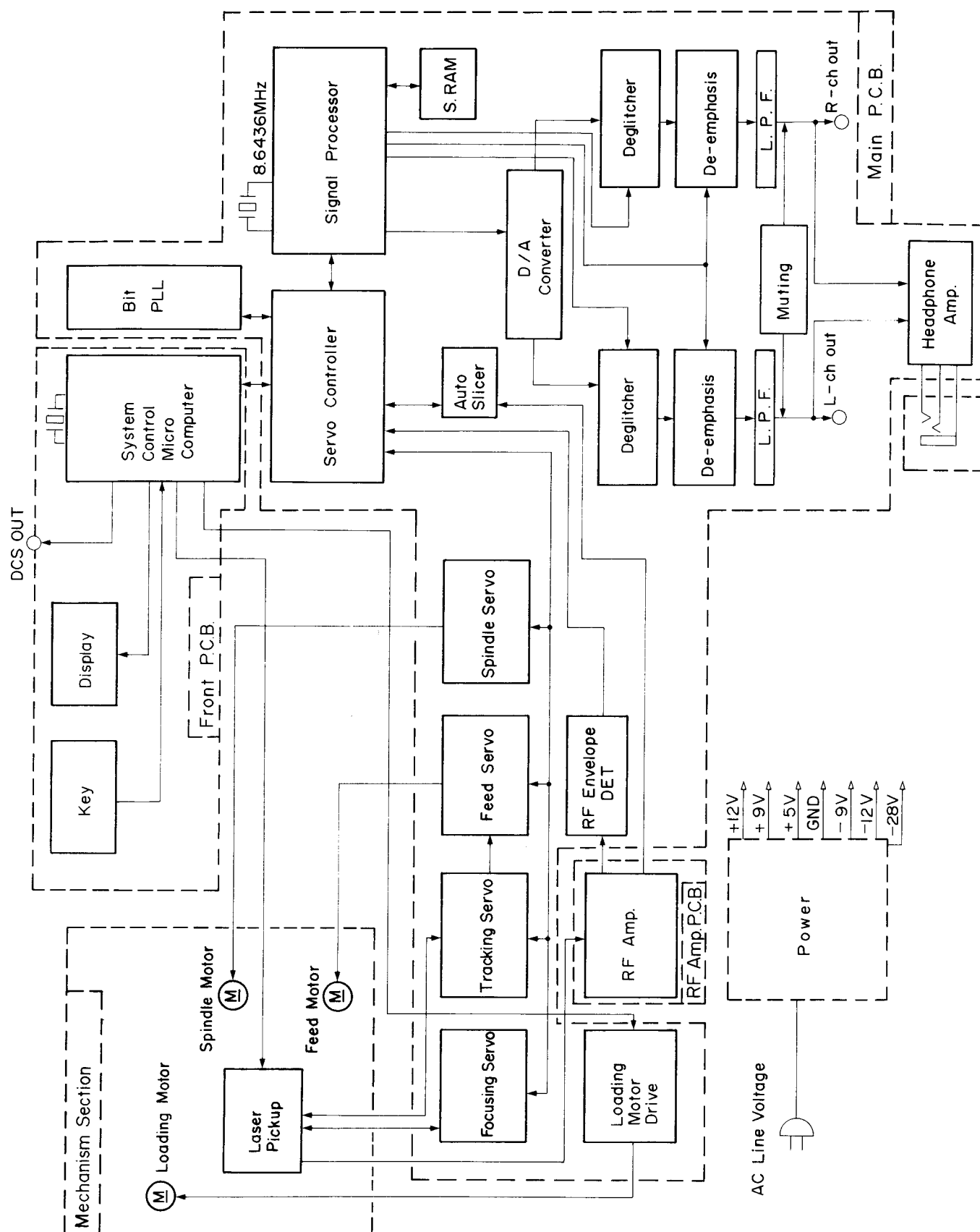
- When the third index point of the first tune is selected.



- When the elapsed time of the third tune which is programmed fourth is 2 minutes 34 seconds.



7. Schematic Block Diagram



8. Description of Major LSI ICs

8-(1) YM3531(IC301)

Outline: YM3531 is a silicon-gate CMOS LSI for CD player servo-control used with YM2201-K (SGP) for demodulation of EFM signal from photo pickup and various intelligent servo-control functions (focus, spindle, tracking, feed).

Function: 1) Digitizes EFM signal, performs clock regeneration and separates sync. signal.

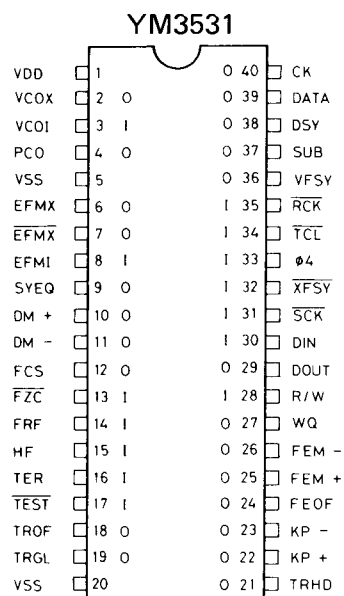
2) EFM demodulates the digital signal described above and outputs it to YM2201-K (SGP).

3) Separates Q sub code from the digital signal described above and outputs it to the external microprocessor after CRC checking.

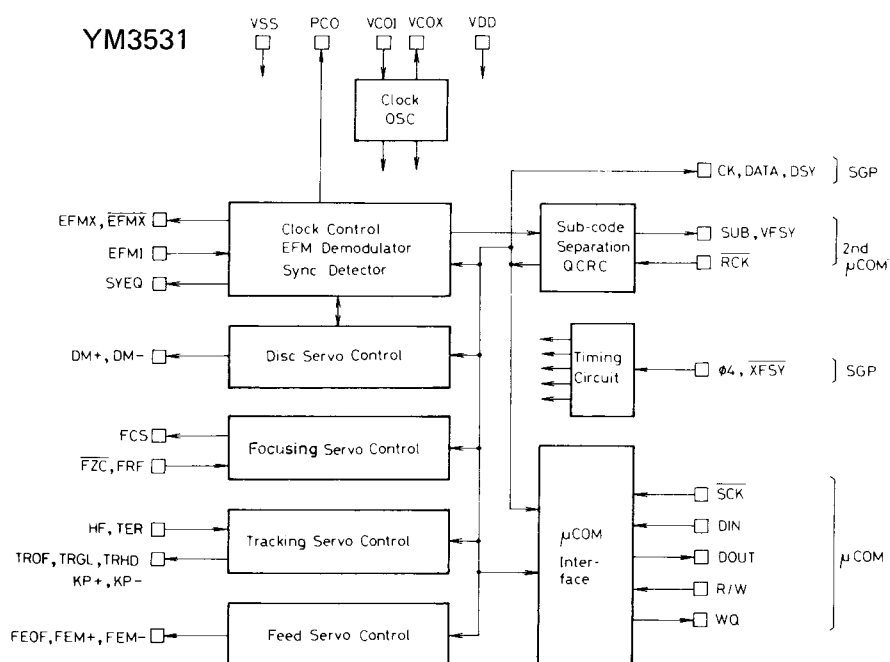
4) Outputs frame phase difference signal from regenerated and standard clocks and controls speed of spindle motor.

5) Performs tracking and feed motor servo-controls for music scanning and fast forward by input of commands from microprocessor.

Terminal layout



Block diagram



Description of terminal functions

- 1) EFM signal external circuit ⑧ EFMI, ⑦ EFMX, ⑥ EFMX
Inputs signal with optimum level (1 – 2 Vpp) from photo pickup to EFMI terminal and mutually opposite phase signal with limited amplitude is generated from EFMX and EFMX. Controls slice level.
- 2) Clock regeneration circuit ④ PCO, ③ VCOI, ② VCOX
Performs clock oscillation (8.6436 MHz on average) when LC resonance circuit is connected between VCOI and VCOX. Output from PCO terminal is phase difference output at polarity change of clock and EFM pattern and can regenerate clock by setting the polarity of variable capacity diode so that the frequency is increased when positive.
- 3) Synchronization coincidence signal ⑨ SYEQ
Output terminal for checking; becomes "H" when synchronizing signal detected from EFM pattern and that of internal counter are coincident.

- 4) Signal to SGP ④ CK, ③ DATA, ③ DSY

CK is clock of 4.3218 MHz on average and the frequency of the VCO is divided by two. DATA is serial signal with bit rate of this clock and contains 8-bit EFM demodulation signal and 5-bit data control signal. DSY is synchronizing signal which becomes "H" with timing coinciding with the first signal.

These three signals are connected to SGP.

- 5) Sub code output ⑦ SUB, ⑥ VFSY, ⑤ RCK

VFSY is synchronizing output combining frame and sub code frame (98-frame). By determining the change from "H" to "L" of this signal externally and sending clock 8 times to RCK terminal, it is possible to take out sub code P – W from SUB output terminal in serial bits.

6) Signal from SGP ③③ $\phi 4$, ③② XFSY

Input terminal to be connected to SGP. $\phi 4$ is a 4.3128 MHz crystal clock and XFSY is a 7.35 kHz frame synchronizing signal.

7) Q code output ②⑦ WQ, ②⑧ R/W, ②⑨ DOUT, ③① $\overline{\text{SCK}}$

Detail of DOUT

Internal state	
CONT	ADR
	TNO
	INDEX
	MIN
	SEC
	FRAME
	P-CODE
	AMIN
	ASEC
	AFRAME

MSB

LSB

SIGN	S2	S1	8F	4F	MZ	FCO	NQ
------	----	----	----	----	----	-----	----

SIGN: Search polarity

S2, S1: Search mode

8F, 4F: Frame error

MZ: Disc motor stops

FCO: Focus out

NQ: New Q code

It is possible to take out the above data to DOUT in bit serial by detecting "H" of WQ by μCOM and sending $\overline{\text{SCK}}$.

This finishes by setting R/W once to "H" after sending out $\overline{\text{SCK}}$ clock.

8) μCOM command ②⑧ R/W, ③① DIN, ③① $\overline{\text{SCK}}$

Detail of DIN

Command
μMIN
μSEC
μFRAME

MSB

LSB

M4	M3	M2	M1	T4	T3	T2	T1
Instruction				Test			

The above data is input by synchronizing and sending out $\overline{\text{SCK}}$ clock and DIN after setting R/W to "H" by μCOM . For instruction except for 7, 1 byte is input and when it is 7, 4 bytes are input.

9) Focusing servo Input: ①③ $\overline{\text{FZC}}$, ①④ FRF, Output: ①② FCS
These terminals are used for input of focusing servo. FCS signal is a signal to input focus. When focusing point has been reached, the lead-in function stops if $\overline{\text{FZC}}$ signal is generated and the FCO flag is disabled internally by the FRF signal having detected the reflected ray.

10) Disc servo ①⑩ DM+, ①① DM-

DM+ and DM- are PWM output of one frame (7.35 kHz) cycle. DM+ and DM- cannot be set to "H" at the same time. In stable conditions during PLAY, they have the resolving-power of 1/47 of one frame i.e. 9.25 ns.

11) Tracking servo Input: ①⑤ HF, ①⑥ TER

Output: ①⑧ TROF, ①⑨ TRGL,
②① TRHD, ②② KP+, ②③ KP-

Samples the change of amplitude of HF signal generated when traversing the track during search at the zero cross point of tracking error signal TER and outputs TROF signal. Correction of track becomes easy because servo is switched on and off by the change of the signal level. Outputs TRHD while outputting KP+ and KP- for tracking and holds tracking error signal.

12) Feed servo ②④ FEOF, ②⑤ FEM+, ②⑥ FEM-

FEM+ or FEM- signal is output as the high-speed feed signal. During this time, FEOF signal is output to cut the feed servo.

13) Test terminal ①⑦ TEST, ③④ TCL

Terminal for testing which is normally "H" by internal pull-up resistor. Not connected.

8-(2) YM2201-K(IC303)

Outline: YM2201-K (SGP) is N channel silicon gate MOS LSI for signal processor in CD player.

Performs digital filtering for correction of digital signal and improvement of sound quality; used with YM3531(SVC).

- Function: 1) Generates standard clock oscillations and timing signals necessary for operation with external crystal oscillator.
- 2) Performs buffering of EFM demodulation signal for absorbing fluctuation in disc speed and exchanges signals with external RAM.
- 3) Unscrambles and deinterleaves by re-sequencing digital signal from YM3531(SVC) into a fixed sequence.
- 4) Performs the detection and correction of error signals and flag processing (double error correction system).
- 5) Performs signal interpolation, pre-hold and muting etc.
- 6) Performs digital filtering (signal cutoff at 20 kHz) by doubling the sampling cycle for each channel L and R to 88.2 kHz and outputs signal for DAC.

9. Other LSI ICs and Internal Block Diagrams of ICs

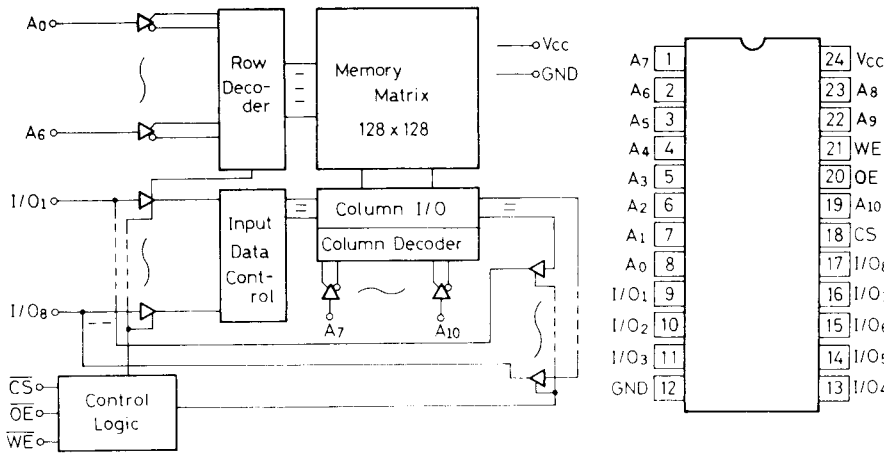
8-(5) μ PD7519CW-209 (IC802): Microcomputer for Display and System control

Pin No.	Symbol	I/O	Function	Active
1	P ₂₀	O	LASER ON	L
2	P ₂₁	O	LOADING OPEN	H
3	P ₂₂	O	LOADING CLOSE	H
4	P ₂₃	O	YM3531 R/W	H
5	RESET	I	—	H
6	PPO	O	Not used (OPEN)	—
7	NC	—	Not used (OPEN)	—
8	INT ϕ	I	YM3531 WQ	H
9	$\overline{\text{SCK}}$	O	YM3531 $\overline{\text{SCK}}$	L
10	SO	O	YM3531 D _{IN}	H
11	SI	I	YM3531 D _{OUT}	H
12	P ₆₀	I	REST SW	L
13	P ₆₁	I	CLOSE SW	L
14	P ₆₂	I	OPEN SW	L
15	P ₆₃	I	DM —	H
16	P ₅₀	I	D ₀ 1511 Interface	H
17	P ₅₁	I	D ₁ 1511 Interface	H
18	P ₅₂	I	D ₂ 1511 Interface	H
19	P ₅₃	I	D ₃ 1511 Interface	H
20	P ₁₀	I	D ₄ 1511 Interface	H
21	P ₁₁	I	Not used (V _{ss})	—
22	P ₁₂	I	A/P 1511 Interface	H
23	P ₁₃	—	D 1511 Interface	H
24	NC	—	(OPEN)	—
25	P ₄₀	O	M ₀ 1511 Interface	H
26	P ₄₁	O	M ₁ 1511 Interface	H
27	P ₄₂	O	M ₂ 1511 Interface	H
28	P ₄₃	O	M _R 1511 Interface	L
29	EVENT	—	Not used (V _{ss})	—
30	X	—	Oscillation Circuit	—
31	X	—	Oscillation Circuit	—
32	V _{ss}	—	GND	—

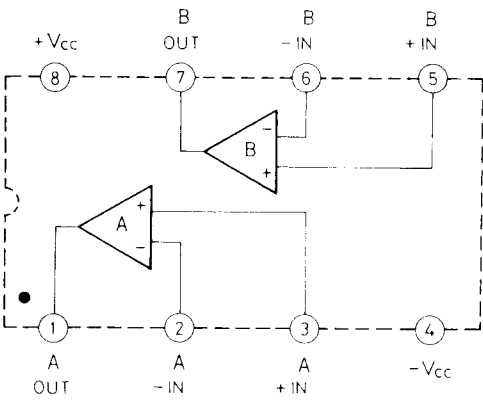
Pin No.	Symbol	I/O	Function	Active
33	S ₇	O	FL P _p	H
34	S ₆	O	FL P _g	H
35	S ₅	O	FL P _f	H
36	S ₄	O	FL P _e	H
37	S ₃	O	FL P _d	H
38	S ₂	O	FL P _c	H
39	S ₁	O	FL P _b	H
40	S ₀	O	FL P _a	H
41	S ₁₅	O	FL P _{s6}	H
42	S ₁₄	O	FL P _{s5}	H
43	S ₁₃	O	FL P _{s4}	H
44	S ₁₂	O	FL P _{s3}	H
45	S ₁₁	O	FL P _{s2}	H
46	S ₁₀	O	FL P _{s1}	H
47	T ₉	O	FL 10G	H
48	T ₈	O	FL 9G	H
49	T ₇	O	FL 8G	H
50	T ₆	O	FL 7G	H
51	T ₅	O	FL 6G	H
52	T ₄	O	FL 5G	H
53	T ₃	O	FL 4G	H
54	T ₂	O	FL 3G	H
55	T ₁	O	FL 2G	H
56	T ₀	O	FL 1G	H
57	V _{LOAD}	—	—	—
58	V _{PRE}	—	—	—
59	P ₃₀	O	REPEAT LED	L
60	P ₃₁	O	REPEAT A $\leftrightarrow$ B LED	L
61	P ₃₂	O	(GRAPHIC OUT)	L
62	P ₃₃	O	INDEX LED	L
63	INT 1	I	Not used (V _{ss})	—
64	V _{DD}	—	+5 V	—

M ₂	M ₁	M ₀	
0	0	0	STAND-BY (OPEN)
0	1	1	NO-DISC
0	0	1	PLAY
0	1	0	PAUSE
1	0	0	SEARCH

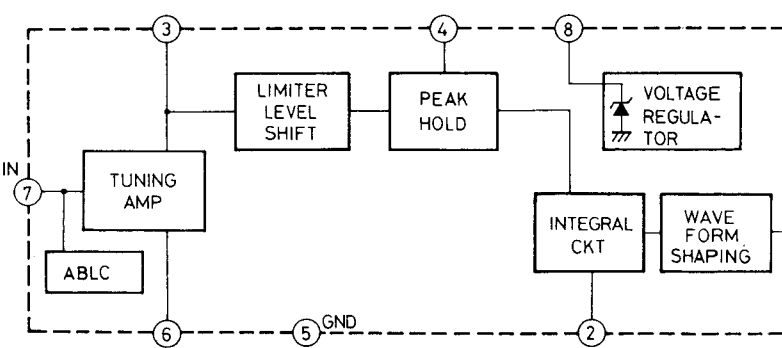
■ HM6116AP-20
■ μ PD446C-2 (High Speed Static C-MOS RAM)



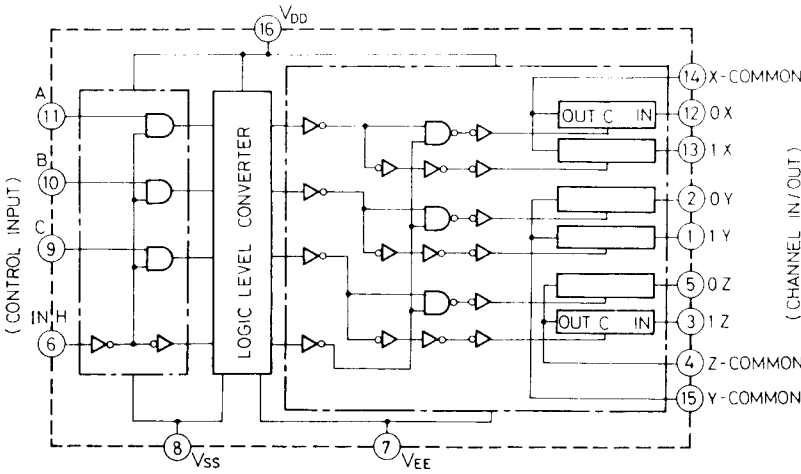
■ M5219P/NJM5532D
■ NJM072D/NJM4560D-D (OP Amp.)



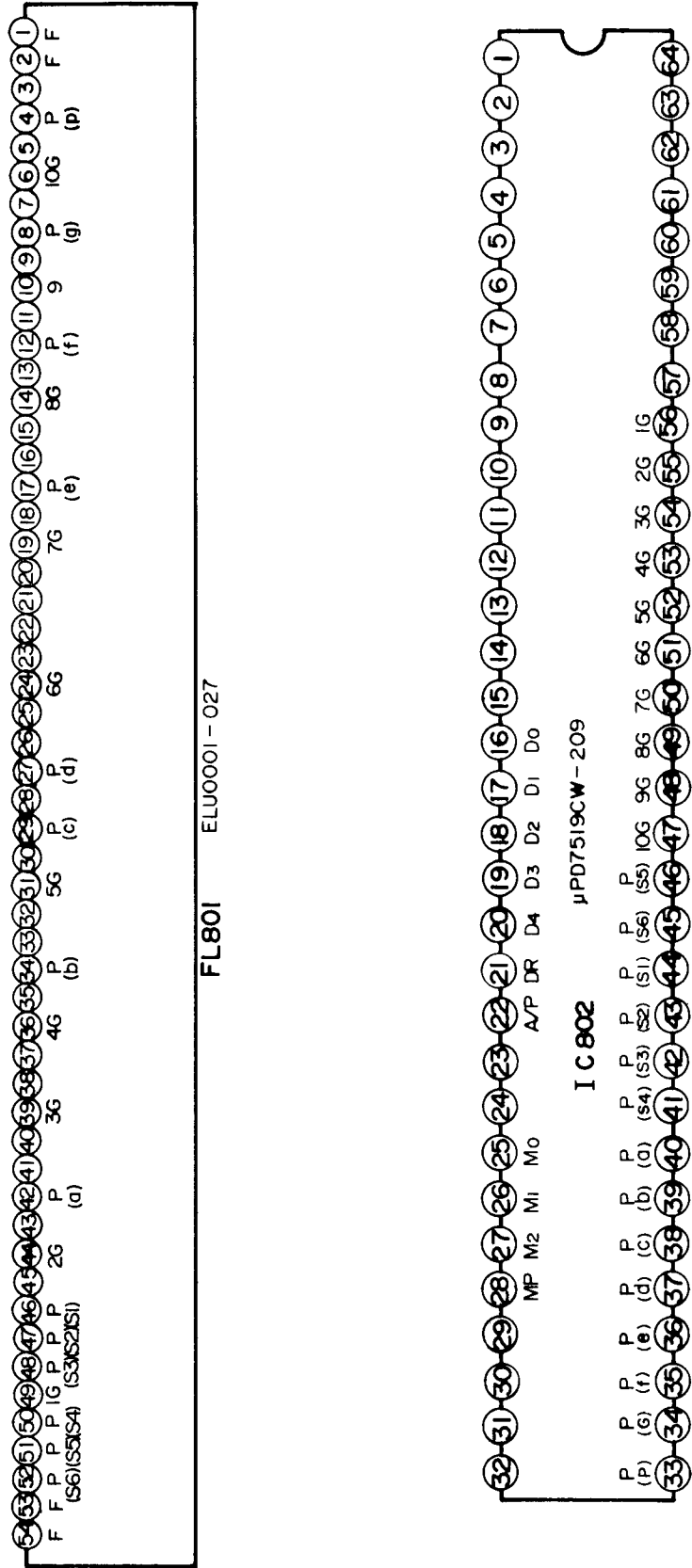
■ μ PC1473HA



■ BU4053B (Analog Switch)



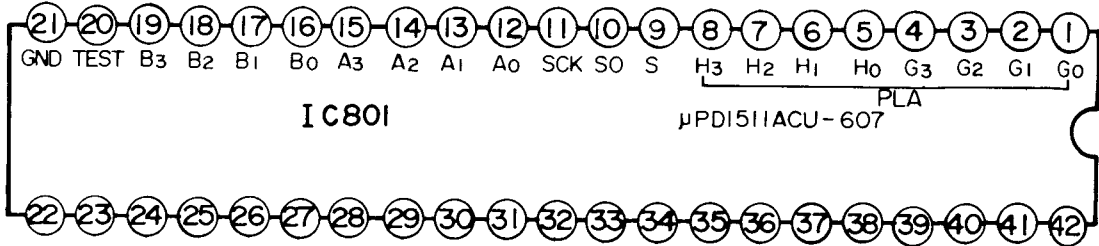
8-(3) Terminal layout of FL801 and IC802



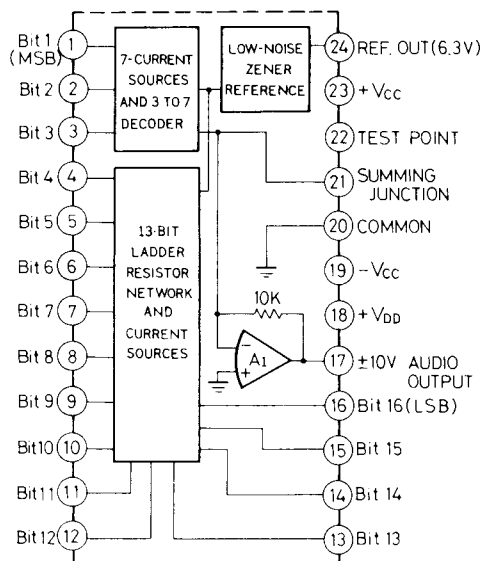
8-(4) μPD1511ACU-607 (IC801): Microcomputer for KEY, DCS and Remote control

Pin No.	Symbol	I/O	Function	Active	Pin No.	Symbol	I/O	Function	Active
42	INT	I	MR 7519 Interface	L	21	Vss	—	GND	—
41	Vcc	—	+5 V	—	20	TEST	—	(Vss)	—
40	F3	O	D3 7519 Interface	H	19	B3	I	KEY Matrix Input	L
39	F2	O	D2 7519 Interface	H	18	B2	I	KEY Matrix Input	L
38	F1	O	D1 7519 Interface	H	17	B1	I	KEY Matrix Input	L
37	F0	O	D0 7519 Interface	H	16	B0	I	KEY Matrix Input	L
36	E3	O	PAUSE LED	L	15	A3	I	Single PLAY	H
35	E2	O	PLAY LED	L	14	A2	I	Timer PLAY	H
34	E1	O	RM (Remote Control) LED	L	13	A1	I	Remote Control Input	H
33	E0	O	DCS Output	L	12	A0	I	DCS Input	H
32	D3	O	D4 7519 Interface	H	11	SCK	—	(Vss)	—
31	D2	O	A/P 7519 Interface	H	10	SO	—	(Vss)	—
30	D1	O	DR 7519 Interface	H	9	SI	—	(Vss)	—
29	D0	—	(Vss)	—	8	H3	O	KEY Matrix Output	H
28	C3	—	(Vss)	—	7	H2	O	KEY Matrix Output	H
27	C2	I	M2 7519 Interface	H	6	H1	O	KEY Matrix Output	H
26	C1	I	M1 7519 Interface	H	5	H0	O	KEY Matrix Output	H
25	C0	I	M0 7519 Interface	H	4	G3	O	KEY Matrix Output	H
24	RES	—	Reset Terminal	L	3	G2	O	KEY Matrix Output	H
23	X	—	Oscillation Circuit	—	2	G1	O	KEY Matrix Output	H
22	X	—	Oscillation Circuit	—	1	G0	O	KEY Matrix Output	H

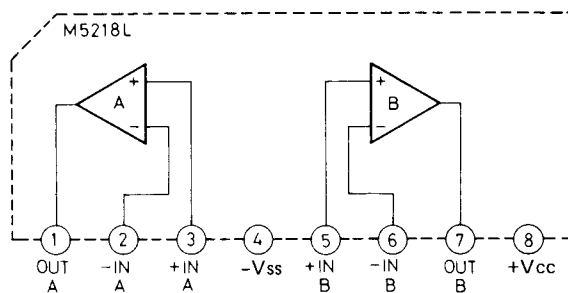
— Terminal layout of IC801 —



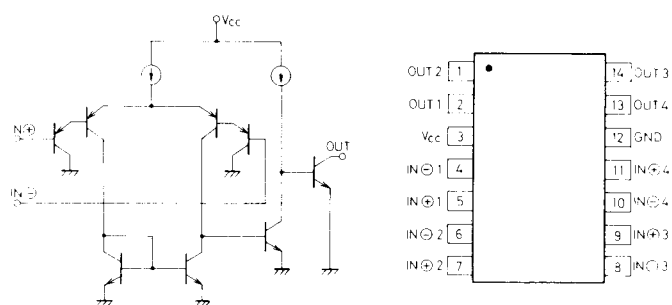
■ PCM53JP-V-2 (D/A Converter)



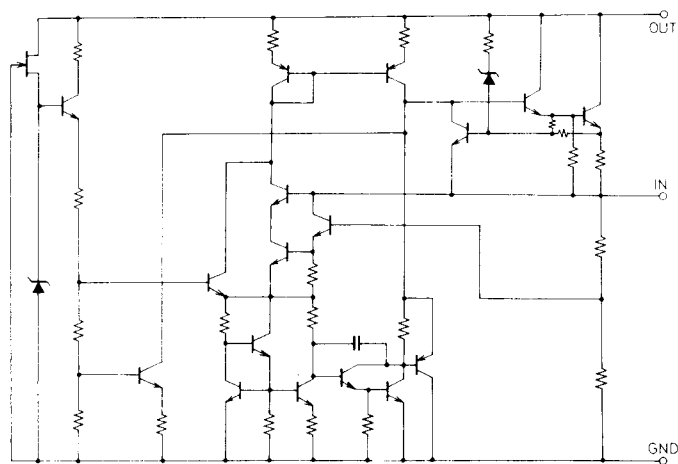
■ M5218L (OP Amp.)



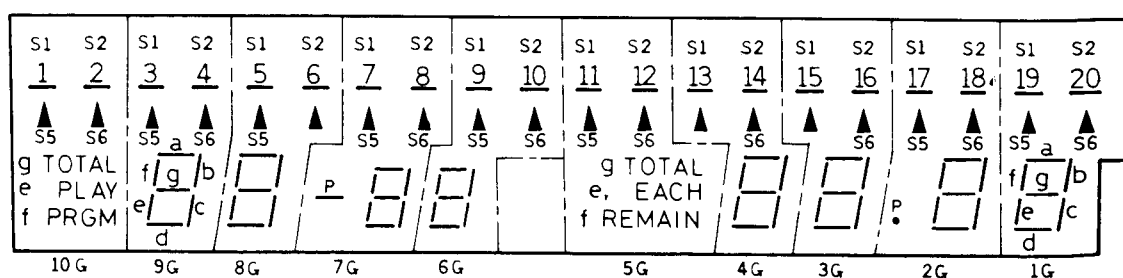
■ NJM2901N (Comparator)



■ NJM78M05A (Regulator)



■ ELU0001-027 (FL Display Tube)



10. Disassembly Procedures

10-(1) Removal of metal cover

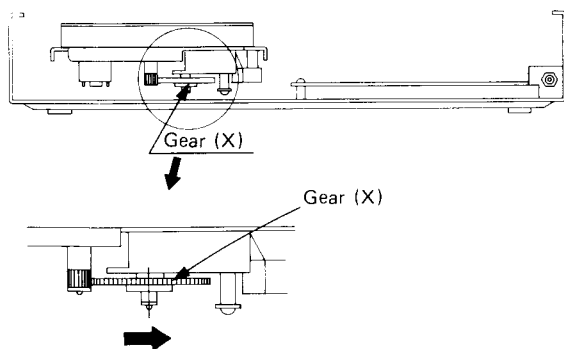
1. Remove the six securing screws.
2. Extract the metal cover by pulling it aslant and upward to the rear, while slightly lifting it.
3. When difficult to demount, removal can be facilitated by lightly pushing up the metal cover at its front side from its rear.

10-(2) Removal of front panel

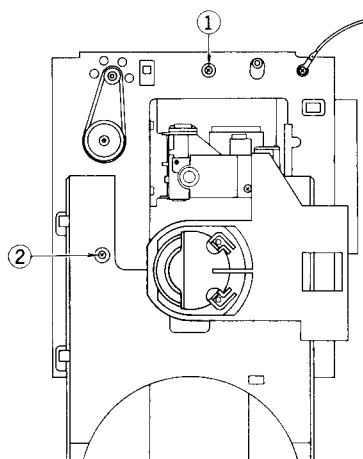
1. Remove the three securing screws (from the bottom side).
2. Remove the two plastic rivets (from the upper side).
3. Remove the two screws securing the slanting front board, and then disconnect a connector and remove two flat wires.
4. After taking the tray outwards by turning on the power, pull out the front panel slantwise downwards.

10-(3) Removal of mechanical assembly

1. Detach the front panel.
2. Extract the tray by manually rotating clockwise (from left to right) the gear (X) (shown in the figure below).

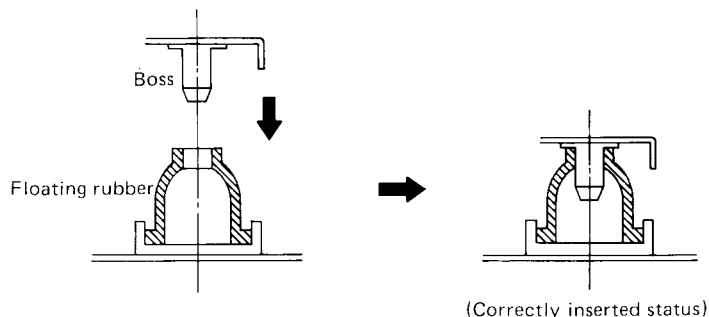


3. Remove screws ① and ② (shown in the figure below).



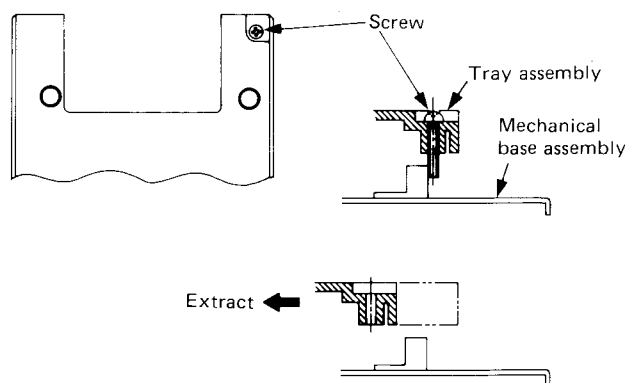
4. Replace the tray assembly to its original position and lift upright the mechanical assembly.

Note: When reinstalling the mechanical assembly, confirm that the four bosses (shown in the figure below) on its rear side are correctly inserted into the floating rubber of the chassis (shown in the figure below).



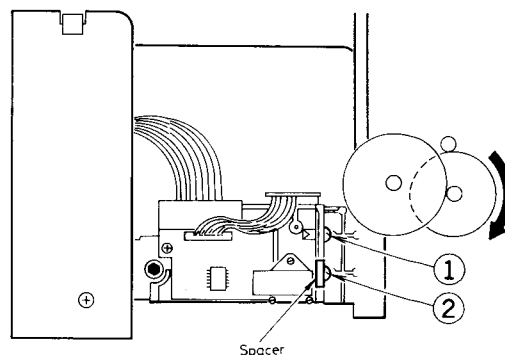
10-(4) Removal of tray assembly

Remove the stopper screw (shown in the figure below) and extract the tray assembly to the front.



10-(5) Removal of laser pickup

Rotate the gear (shown in the figure below) clockwise to cause the laser pickup to be shifted to the internal side. The laser pickup can be demounted by removing two screws ① – ② (shown in the figure below).

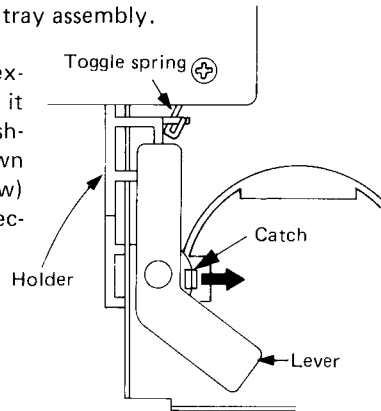


Note: Pay careful attention not to lose the spacer at removal.

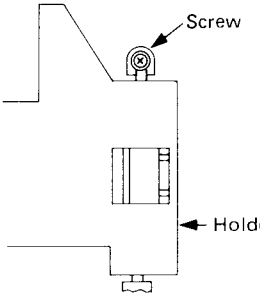
10-(6) Removal of spindle motor

- 1. First demount the tray assembly.
- 2. Detach the lever.

The lever can be extracted by pulling it upward while pushing the catch (shown in the figure below) in the arrow direction.

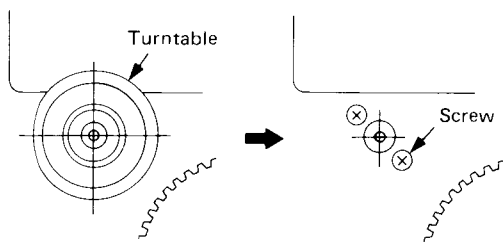


- 3. Detach the holder by removing the screw.



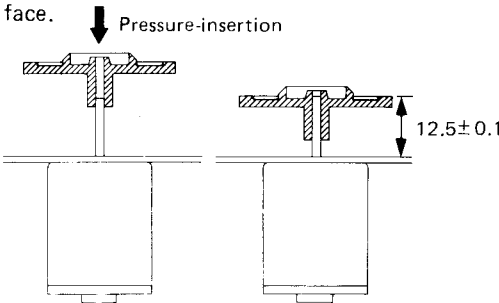
Note: After the holder has been reinstalled, correctly replace the toggle spring (shown in the figure under 10-(6)-2).

- 4. Extract the turntable and remove the two screws.

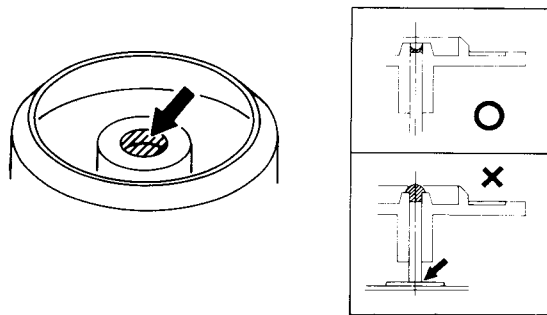


Note: Installation of spindle motor

- 1. Replace the two screws by applying uniform tightening torque.
- 2. Pressure-insert the turntable. Straight insertion must be made while supporting the motor at its lowest section, and accurate alignment must be achieved to obtain its height of 12.5 mm ± 0.1 mm from the mechanical base top surface.



- 3. After pressure-insertion is made, bond the motor shaft and turntable together (arrow-mark section on the left-hand figure below). Use the bonding agent of "LOCTITE #460" while limiting the applied volume to a minimum. Exercise care not to cause surplus bonding agent to pile up on the turntable, as shown in the lower-side figure. Absolutely avoid causing the bonding agent to attach to the motor bearings (arrow-mark section on the right-hand figure above).



11. Application Points for Grease and Adhesive

Grease (Refer to next page.)

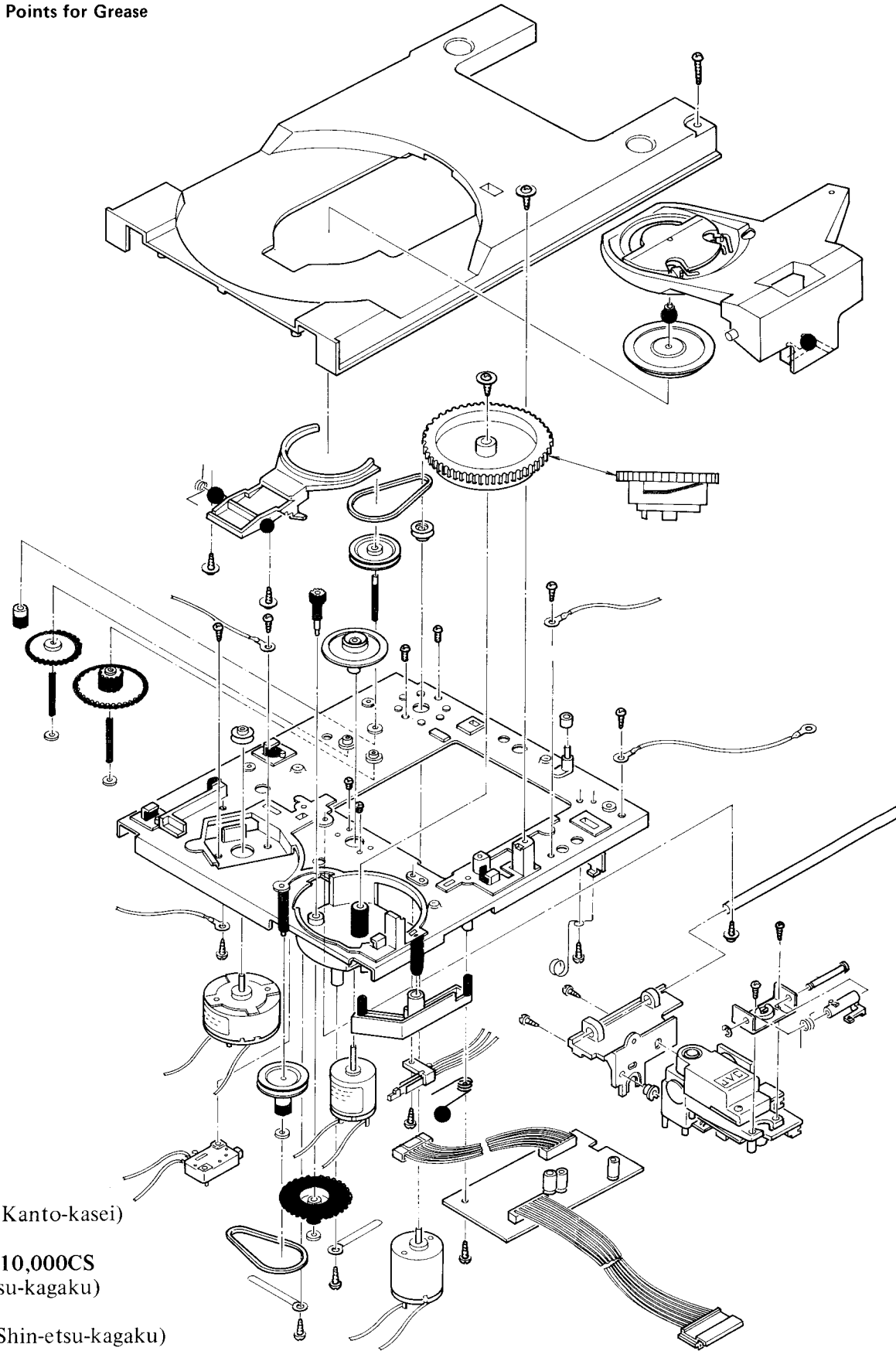
Item	Points to apply grease
KF96H; 10,000 CS (Shin-etsu-kagaku)	● Engagement portion of Holder ass'y and Toggle spring.
G-501 (Shin-etsu-kagaku)	● Fitting portion of feed shaft and bushing. ● Sliding portion of right edge of PU base and upper side of mechanism base.
G311S (Kanto-kasei)	● Gear engagement portion. ● Engagement portion of tray and mechanism base. ● Top of cam on the under side of main gear in loading section. ● Boss of Lever. ● Lever portion of mechanical base. ● Spindle portions of gears and pulleys.

Adhesive

Item	Points to apply adhesive
LOCTITE #460	● Joining the spindle motor shaft and turntable together.

Note: If the specified greases and adhesives are not available, consult your nearest JVC dealer.

11-(1) Application Points for Grease



12. Maintenance of Laser Pickup

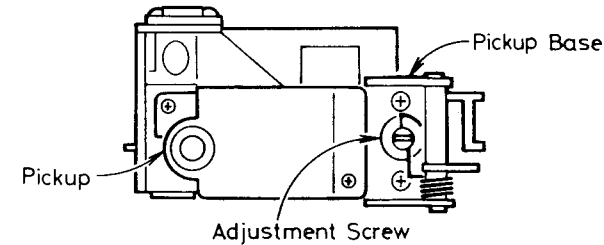
12-(1) Service life of the laser diode

1. Connect the IC802 pin ① of Front PCB (ENN-028-2) to GND, and turn the power switch ON. Then measure the laser radiation power with the laser power meter. If the indication is obtained less than 0.1 mW, then the service life of the laser diode should be judged as having expired.
2. When the EFM output is extremely low, that cannot focus enough, the service life of the laser diode should be judged as having expired.

12-(2) Replacement of the pickup and procedure of adjustment

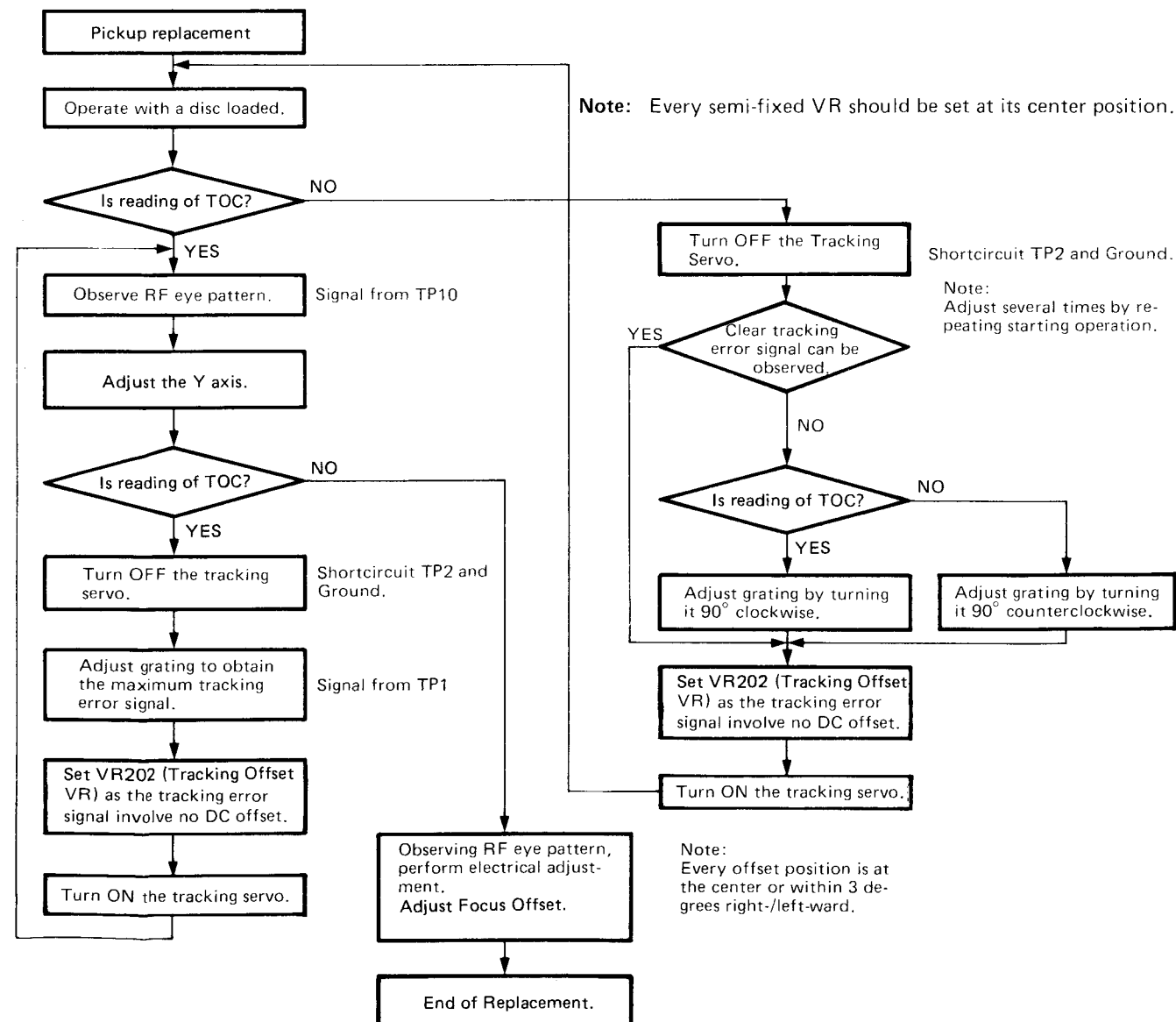
1. Remove the old pickup from the pickup base assembly with loosening two screws, and disconnect two connectors.

2. Take out a new pickup from the package, and connect two connectors.
3. When replacing the pickup, it is recommended to pre-set the adjustment screw at the position shown in the figure below.



4. Attach it to the pickup base with two screws.
5. Don't touch the objective lens surface in these procedure.
6. Adjust grating referring to the adjustment procedure.

Note: Every semi-fixed VR should be set at its center position.



13. Adjustment Procedures

13-(1) PLL freerun adjustment

1) Adjustment instrument

Frequency counter

2) Adjusting procedure

1. Connect the frequency counter between ENN-028 TP ⑪ and GND.
2. Short the TP ⑩ and GND.
3. Adjust the L301 to 4.32 ± 0.01 MHz indicated on the frequency counter with the regulating rod.
4. Perform this checking no sooner than switching on the power.

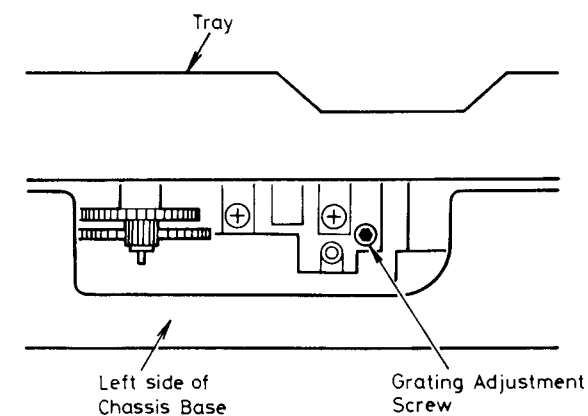
13-(2) Grating adjustment

1) Adjustment instruments

Oscilloscope, Normal disc

2) Adjusting procedure

1. Connect the oscilloscope between ENN-028 TP ① and GND.
2. Play the disc.
3. Play the disc until 1/3 of the program area is played. (15 minutes in passing time at 34 mm radius)
4. Short the TP ② and GND.
5. Drive the grating adjustment screw of the laser pickup, and find the point where the tracking error signal (waveform on the oscilloscope) becomes maximum amplitude, and then fix it.
6. Return the pickup to the inner track and make sure that the amplitude is no change.
7. Advance the pickup to the outer track and make sure that the amplitude is no change.



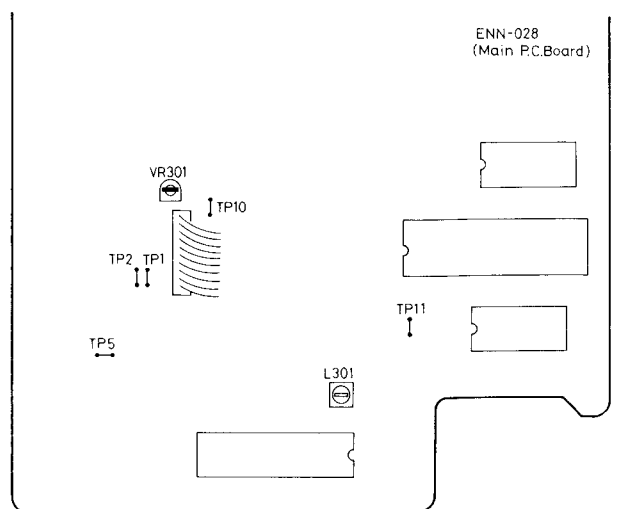
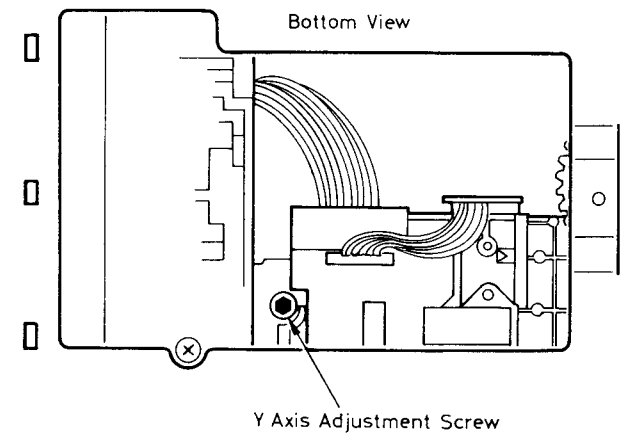
13-(3) Y Axis adjustment

1) Adjustment instrument

Oscilloscope, Hexagonal wrench (2 mm), Normal disc

2) Adjustment procedure

1. Connect the oscilloscope between ENN-028 TP ⑩ and GND.
2. Play the disc.
3. Drive the Y axis adjustment screw under the pickup base, and find the point where the RF signal (waveform on the oscilloscope) becomes maximum amplitude and the finest waveform.
4. This adjustment performs inner area of the disc.
5. Advance the pickup to the outer track and make sure that the amplitude doesn't come down 2/3 below of inner track.



13-(4) Focusing offset adjustment

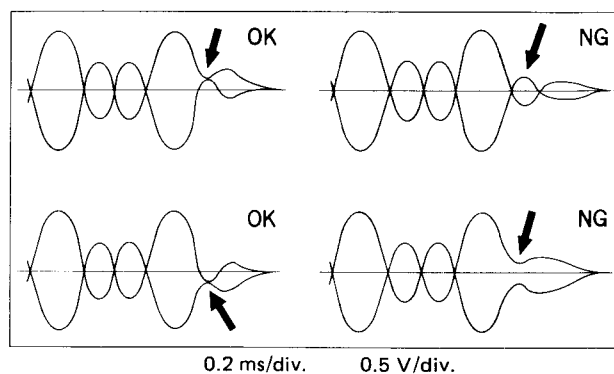
- 1) Adjustment instrument
Oscilloscope, Normal disc
- 2) Adjustment procedure
 1. Connect the oscilloscope between ENN-028 TP ⑩ and GND.
 2. Play the disc.
 3. Adjust the VR202 on ENN-023 as the RF signal (waveform on the oscilloscope) becomes maximum amplitude and the finest waveform.

13-(5) Tracking offset adjustment

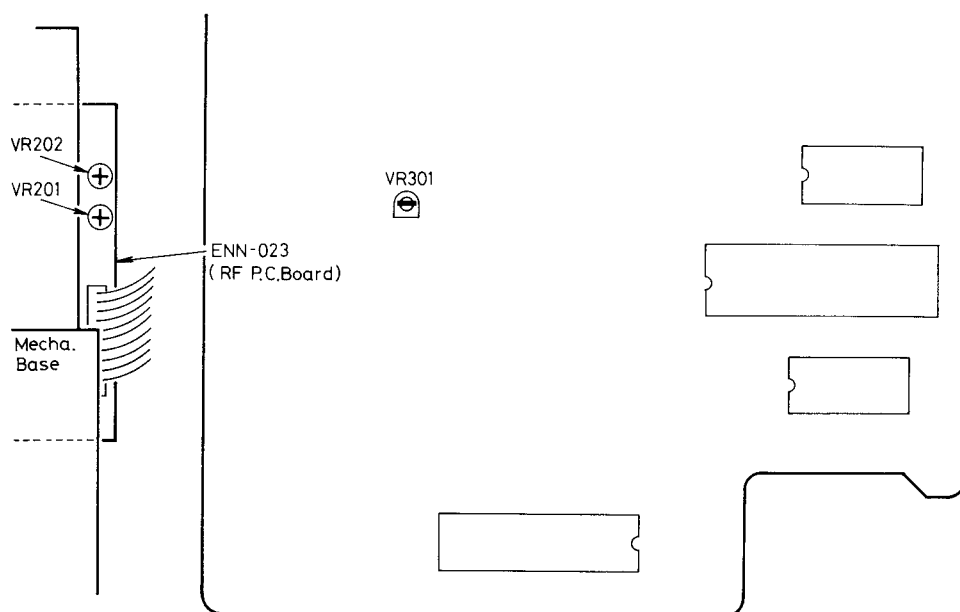
- 1) Adjustment instrument
Oscilloscope, Normal disc.
- 2) Adjustment procedure
 1. Connect the oscilloscope between ENN-028 TP ① and GND.
 2. Play the disc.
 3. Short the TP ② and GND.
 4. Adjust the VR202 on ENN-023 as making the tracking error signal (waveform on the oscilloscope) that the DC level is 0.

13-(6) Kick gain adjustment

- 1) Adjustment instrument
Oscilloscope (2ch), Normal disc.
- 2) Adjustment procedure
 1. Connect the ch1 of oscilloscope between ENN-028 TP ① and GND, the ch2 of oscilloscope between ENN-028 TP ⑤ and GND.
 2. Turn the oscilloscope Normal mode with triggered by the ch2.
 3. Play the disc.
 4. Play back the last number recorded on a disk and press the PAUSE button in mid course. At this time, observing an oscilloscope adjust VR301 to obtain the correct waveform as shown in the figure below.



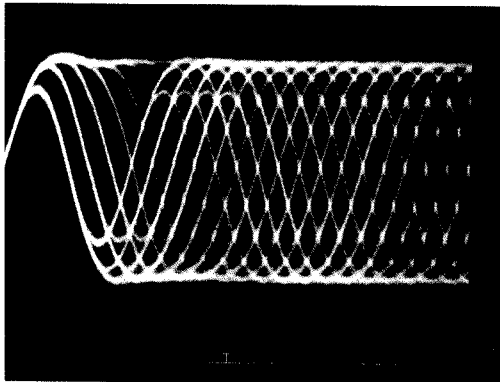
Note: Adjust VR301 so that the fifth peaks (pointed out by the arrow mark in the figure) are tangent each other. If they are crossing or separating each other, continue the adjustment to obtain the best result.



14. Important Waveforms

1. Eye pattern (RF signal)

TP-10; standard eye pattern.

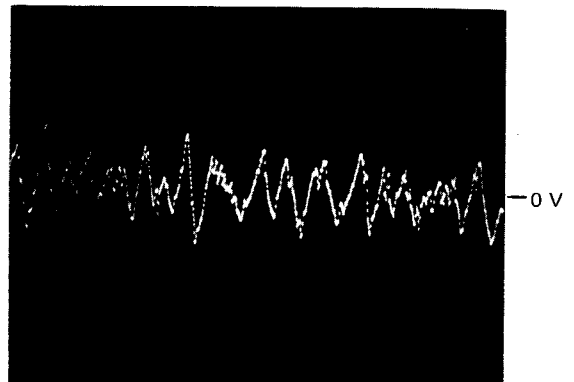


Eye pattern 0.5 μ s/div

0.5 V/div

4. Focus signal during play

TP-9 operates with period of about 0.2 – 1 ms.

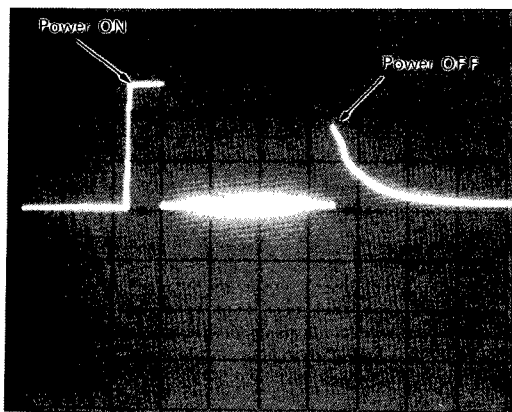


1 ms/div

0.1 V/div

2. Reset signal of microcomputer

Q801 collector (IC802 Pin ⑤)



10 μ s/div

2 V/div

5. Focus search voltage

Between connecting point R400, R404 and GND; the waveform lens is moved up and down by this voltage when the platter is loaded without a disc.



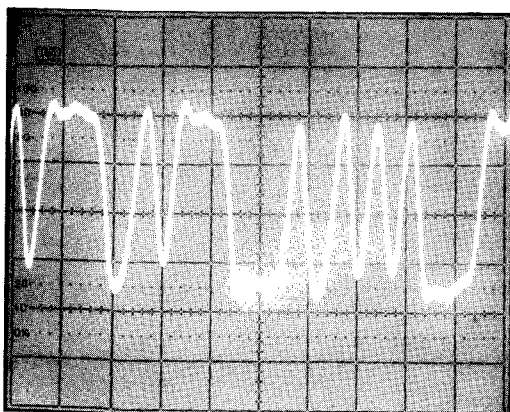
0.5 s/div

1 V/div

3. Eye pattern partially expanded

Shows the TP-10 eye pattern.

Each eye pattern



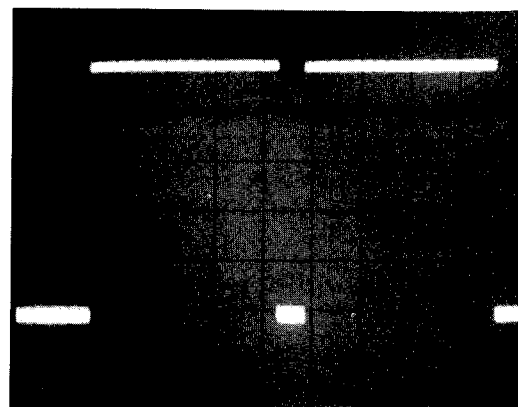
0.5 μ s/div

0.5 V/div

6. Pulse for focus search voltage

Pulse for focus search transmitted from IC301

IC301 Pin ⑫ FCS signal



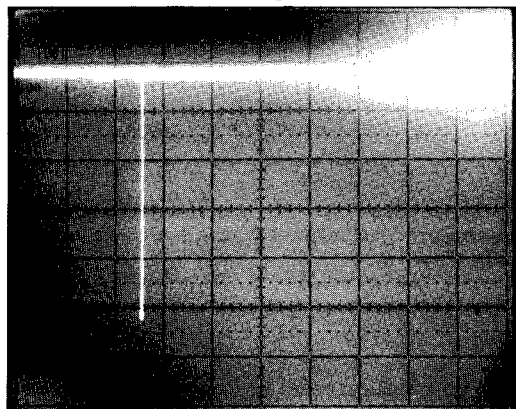
0.5 s/div

1 V/div

7. Focus zero-cross output

Pulse showing that focus output waveform has almost passed the zero point.

IC307 Pin ② output



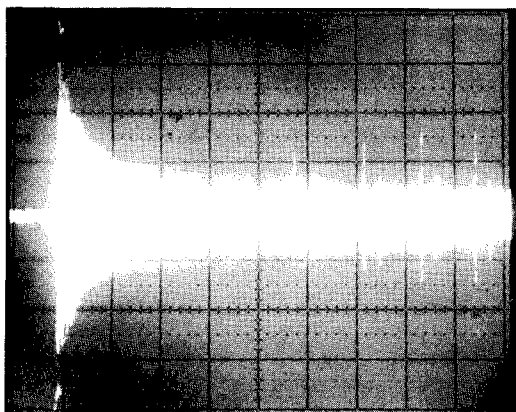
2 ms/div

1 V/div

8. Focus drive waveform

Waveform until focus is obtained, spindle motor starts to rotate and TOC is read.

TP-9, when focus has been finished and motor starts to rotate



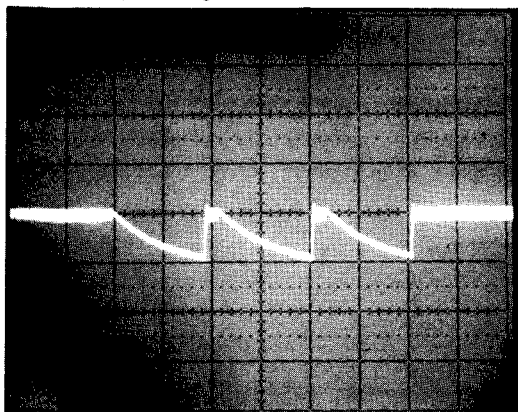
0.2 s/div

1 V/div

9. Drive waveform during focus search

Drive waveform of focus coil when the platter is loaded without a disc.

TP-9; focus signal when no disc is loaded

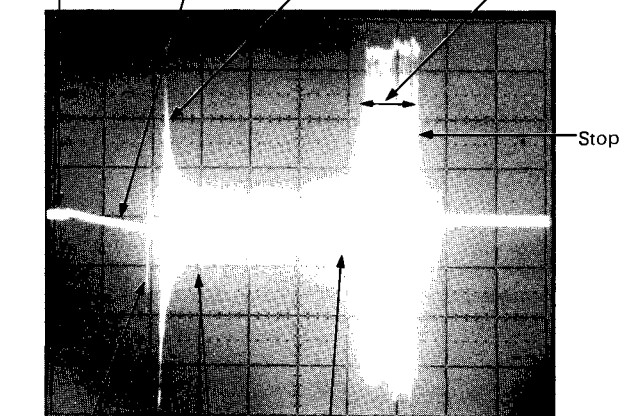


1 s/div

1 V/div

10. Waveform until TOC is read

TP-9 until TOC has been read and spindle motor stops
Before lens starts to move Lens starts to move up Spindle motor starts to rotate. Spindle motor is being braked.



0.5 s/div

2 V/div

Focus obtained.

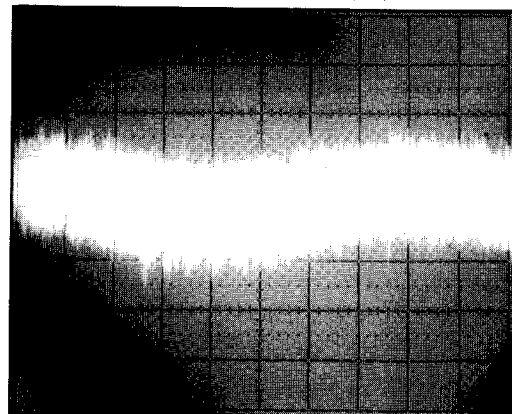
TOC is being read.

TOC has been read.

11. Tracking waveform during normal play

TP-6 output

Waveform during TP-6 play



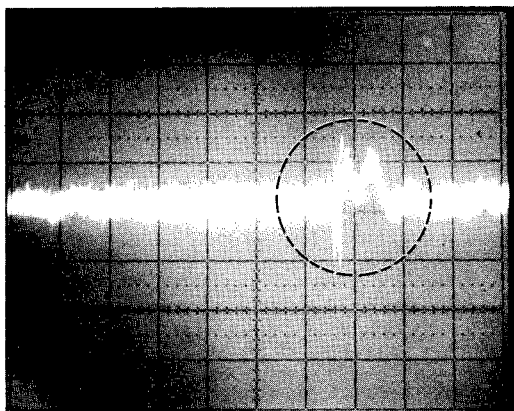
20 ms/div

50 mV/div

12. TP-6 waveform of high speed search in forward direction

Output when track is jumped is visible

TP-6; in case of transporting in high speed search ►►



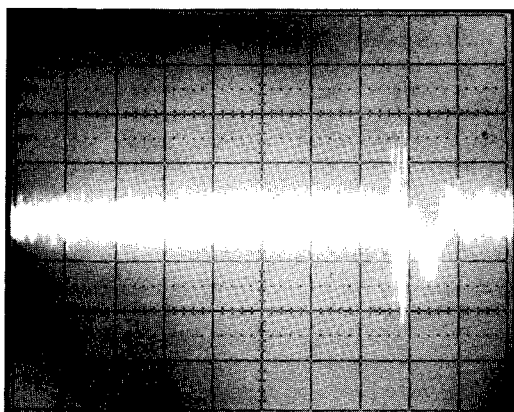
5 ms/div

0.2 V/div

13. TP-6 waveform of high speed search in backward direction

The waveform the reverse of that in high speed search in forward direction is shown.

TP-6; in case of returning by high speed search ◄◄



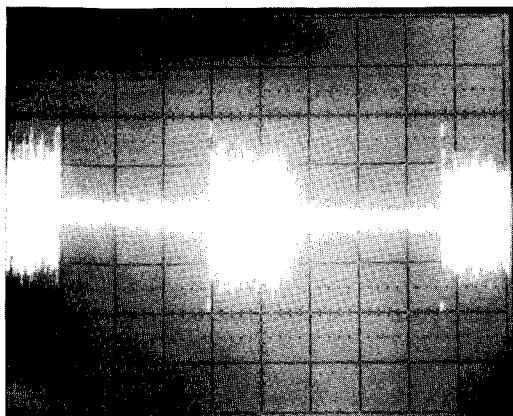
5 ms/div

0.2 V/div

14. Drive waveform during high speed search

Output such as noise is output when track is crossed.

TP-6 during high speed search

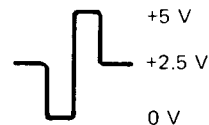


10 ms/div

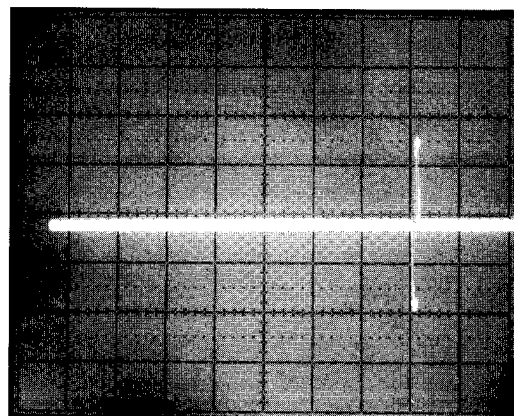
1 V/div

15. Kick pulse when searching

When advancing the track, waveform below is output.



Kick pulse of TP-4 when ►► is used.

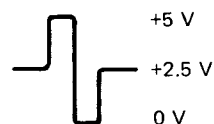


5 ms/div

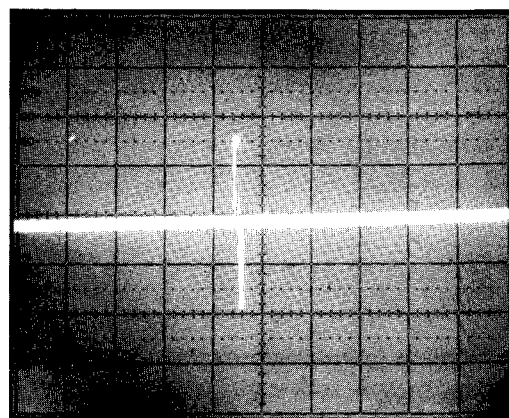
0.5 V/div

16. Kick pulse when searching

When returning the track, waveform below is output.



Kick pulse of TP-4 when ◄◄ is used.



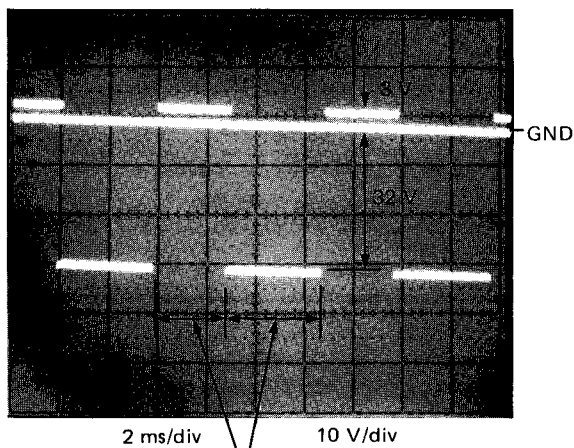
5 ms/div

0.5 V/div

17. Part of FL drive waveform

Duty is changed depending on letter indicated.

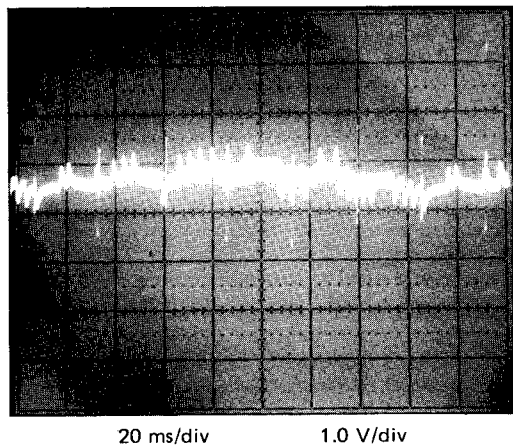
IC802 Pin ① FL drive waveform (changes depending on the indication)



This width changes.

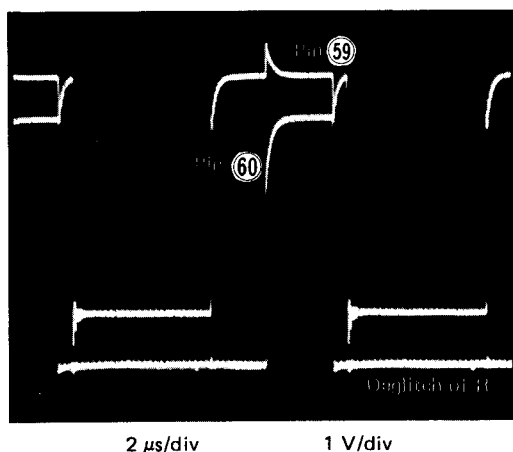
18. Spindle motor drive waveform during play

Spindle motor drive waveform during play

**19. L/R switching signal and deglitch signal of R**

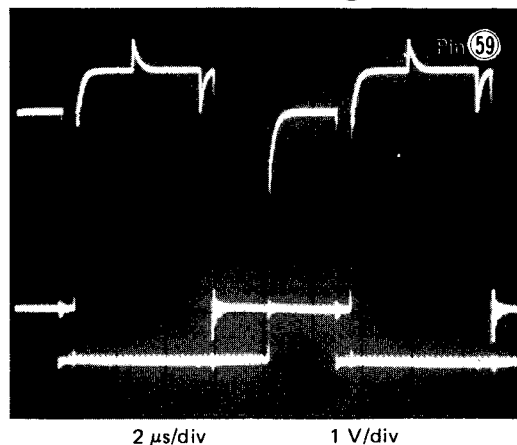
R deglitch signal is input when switching signal is at "H" level.

Waveforms of IC303 Pins ⑤⑨ and ⑥①

**20. L/R switching signal and deglitch signal of L**

L deglitch signal is input when switching signal is at "L" level.

Waveforms of IC303 Pins ⑤⑨ and ⑥①

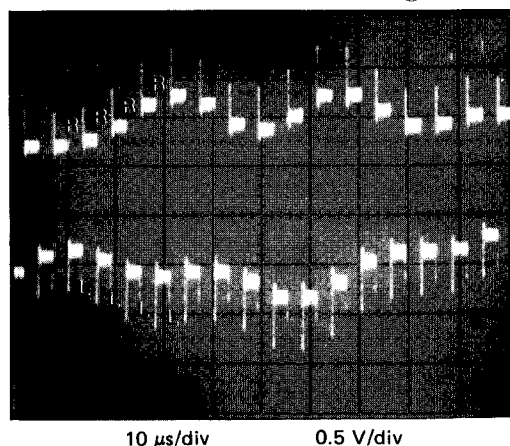


Note: Photos ⑱ and ⑳ are shifted by 1 V for better visibility.

21. AF signal switched after D/A

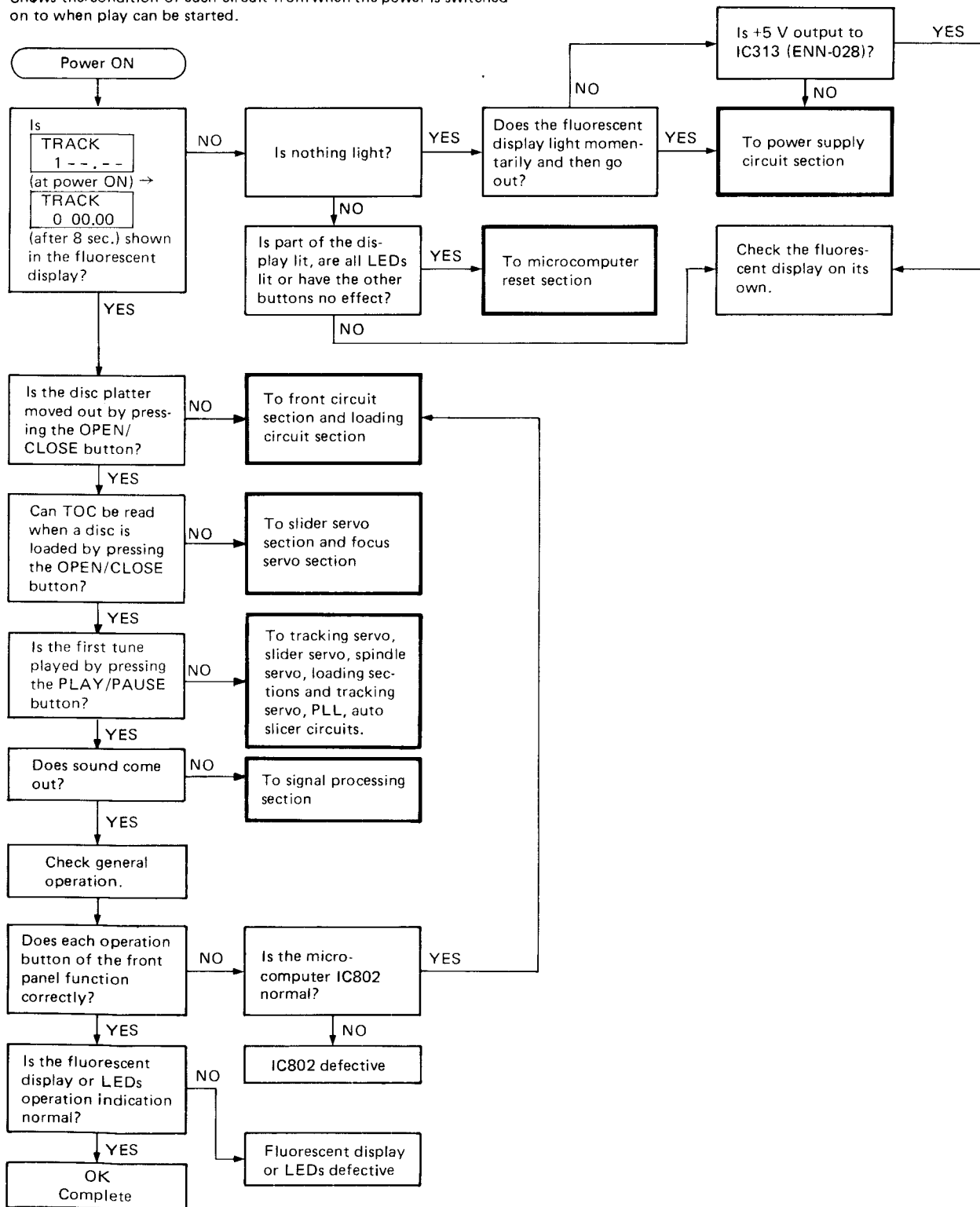
Waveform showing that R and L are output alternately.

R/L signal switched of IC304 Pin ⑰

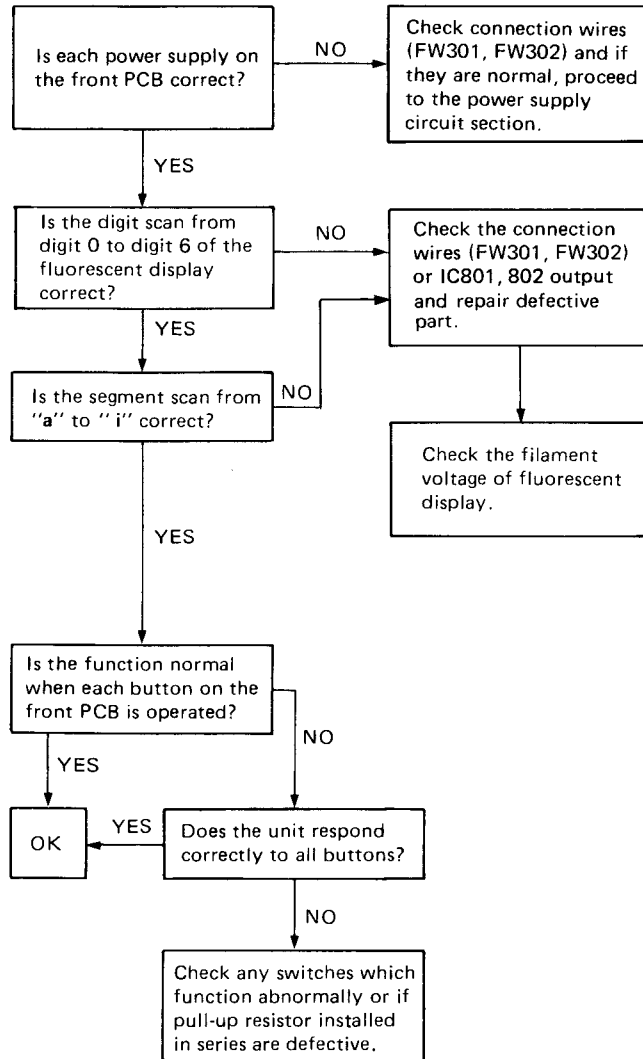


15. Troubleshooting

Shows the condition of each circuit from when the power is switched on to when play can be started.

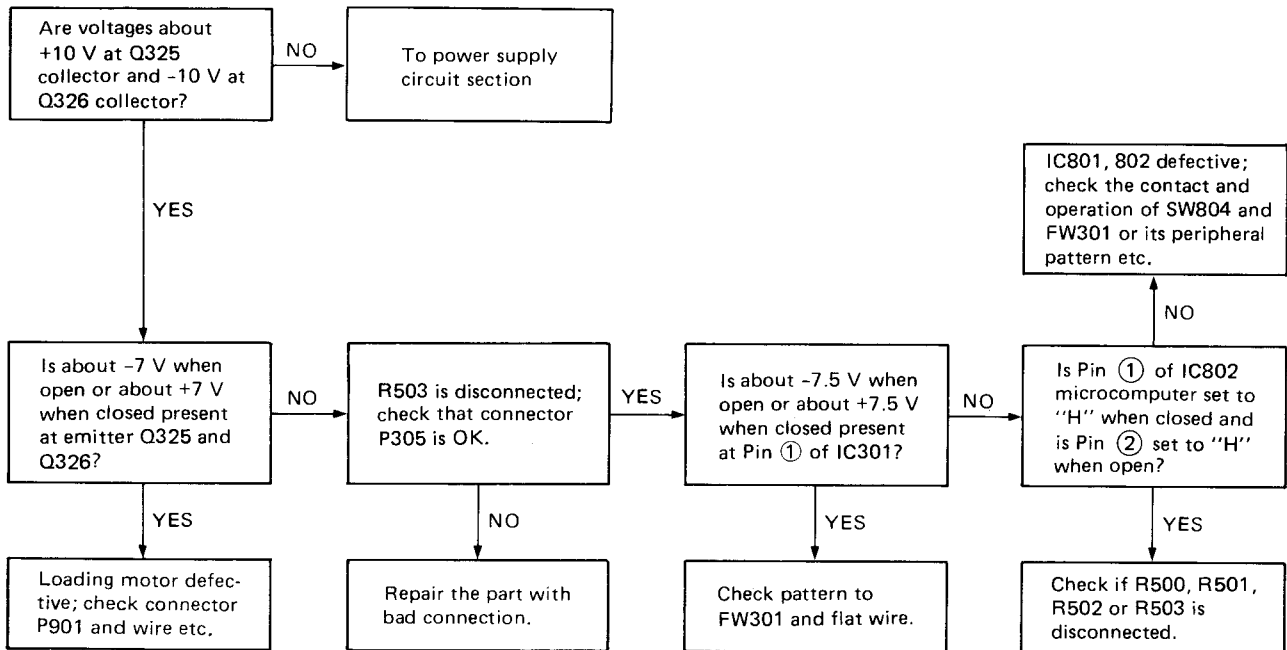


Front PCB section

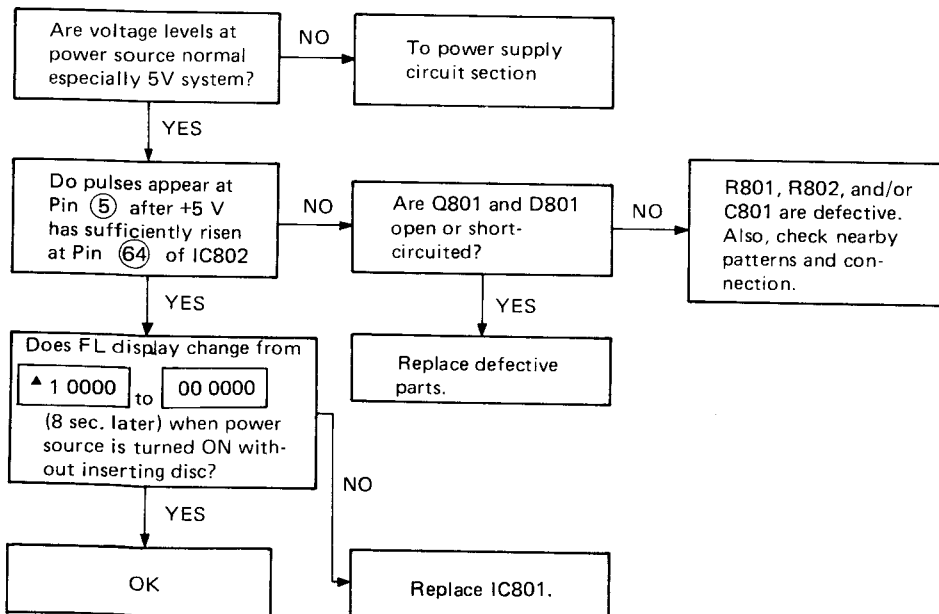


Loading circuit

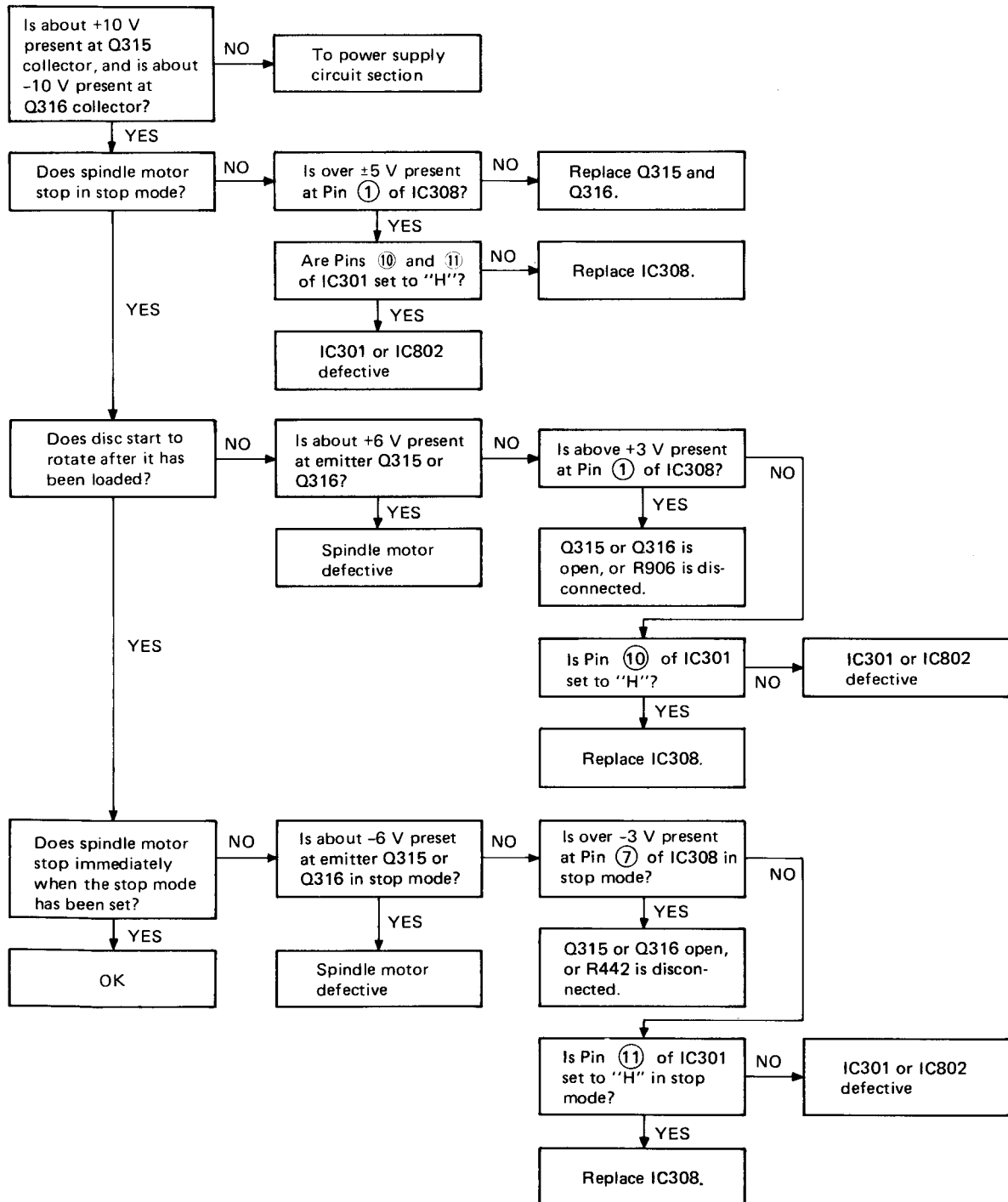
(Perform these steps when the drawer does not move even when the OPEN/CLOSE button on the front panel is pressed.)



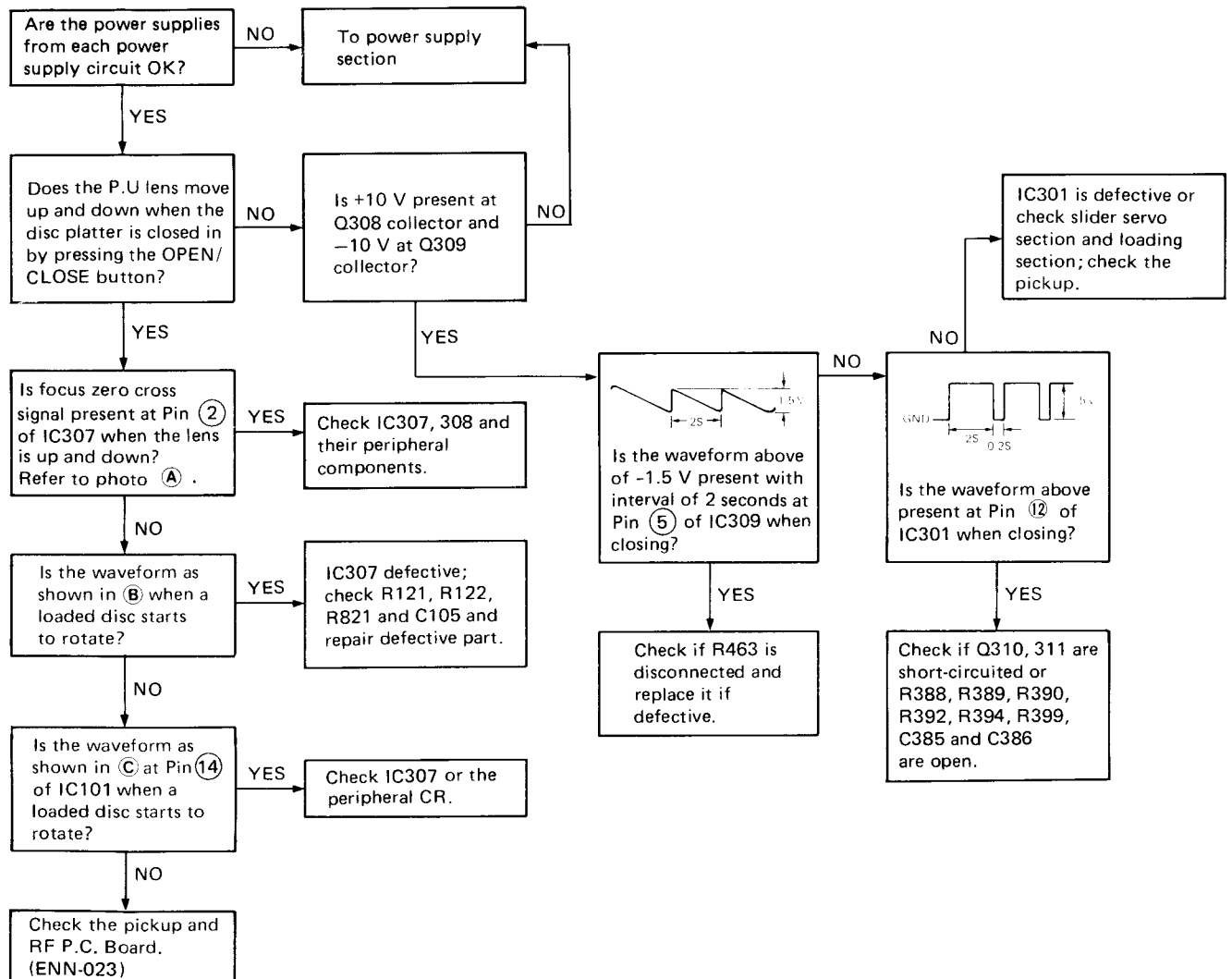
Reset circuit section



Spindle motor section

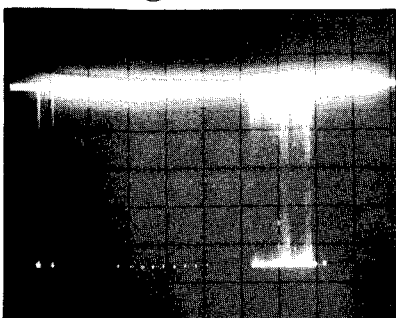


Focus servo section



(A) Output waveform of focus zero-cross
Minus pulse is generated when focus signal passes near zero.

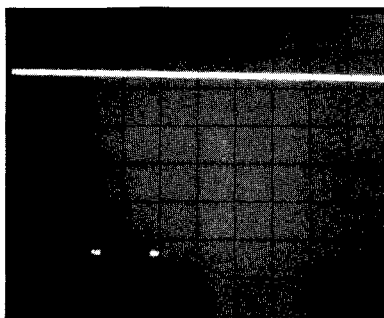
IC307 Pin ⑬



0.2 s/div 5 V/div

(B) Waveform when focus zero-cross is started to play
Focus zero-cross signal just before play starts; pulse width is about 10 ms.

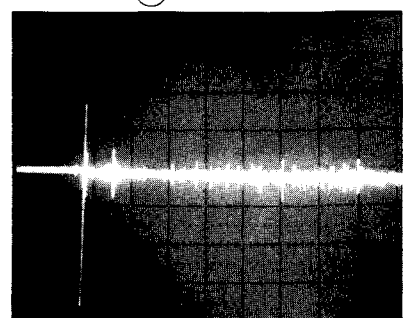
IC307 Pin ⑬



50 ms/div 5 V/div

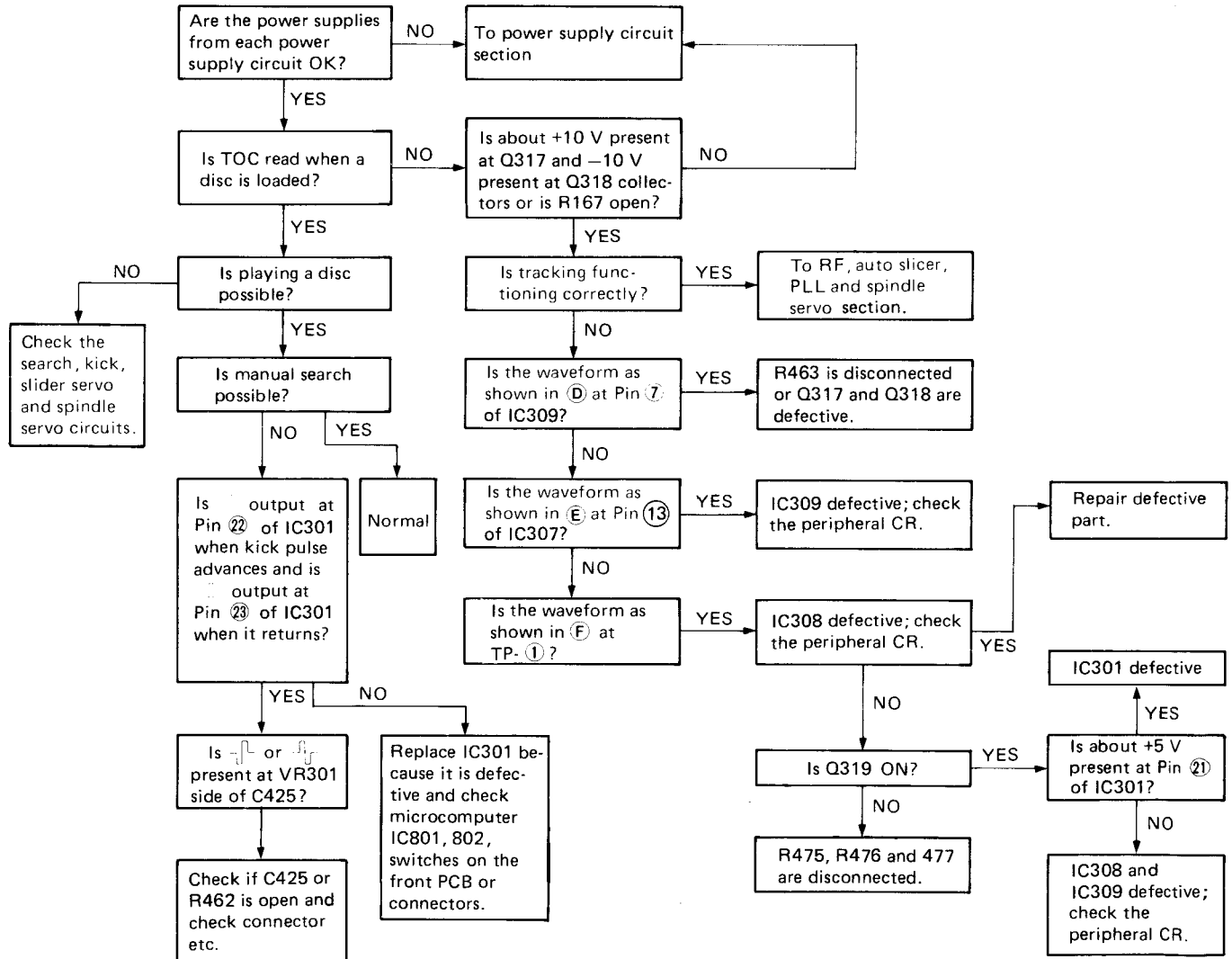
(C) Focus signal when a loaded disc starts to be played
Strong signal is output when focus starts to be obtained but it becomes of small amplitude when it enters in servo loop.

IC307 Pin ②



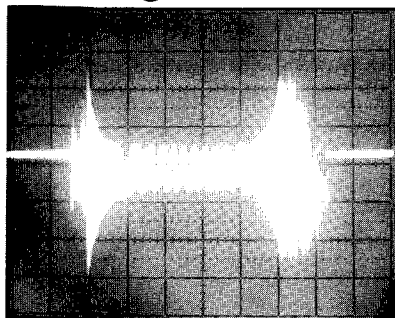
0.1 s/div 0.5 V/div

Tracking servo section



D Waveform when a disc is loaded
Shows until brake is operated after TOC has been read.

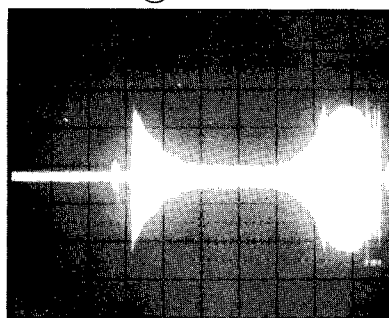
IC309 Pin ⑦



0.2 s/div 2 V/div

E Waveform when a disc is loaded
Shows until brake is operated after TOC has been read.

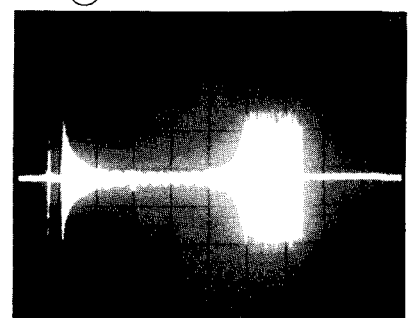
IC307 Pin ⑭



0.2 s/div 5 V/div

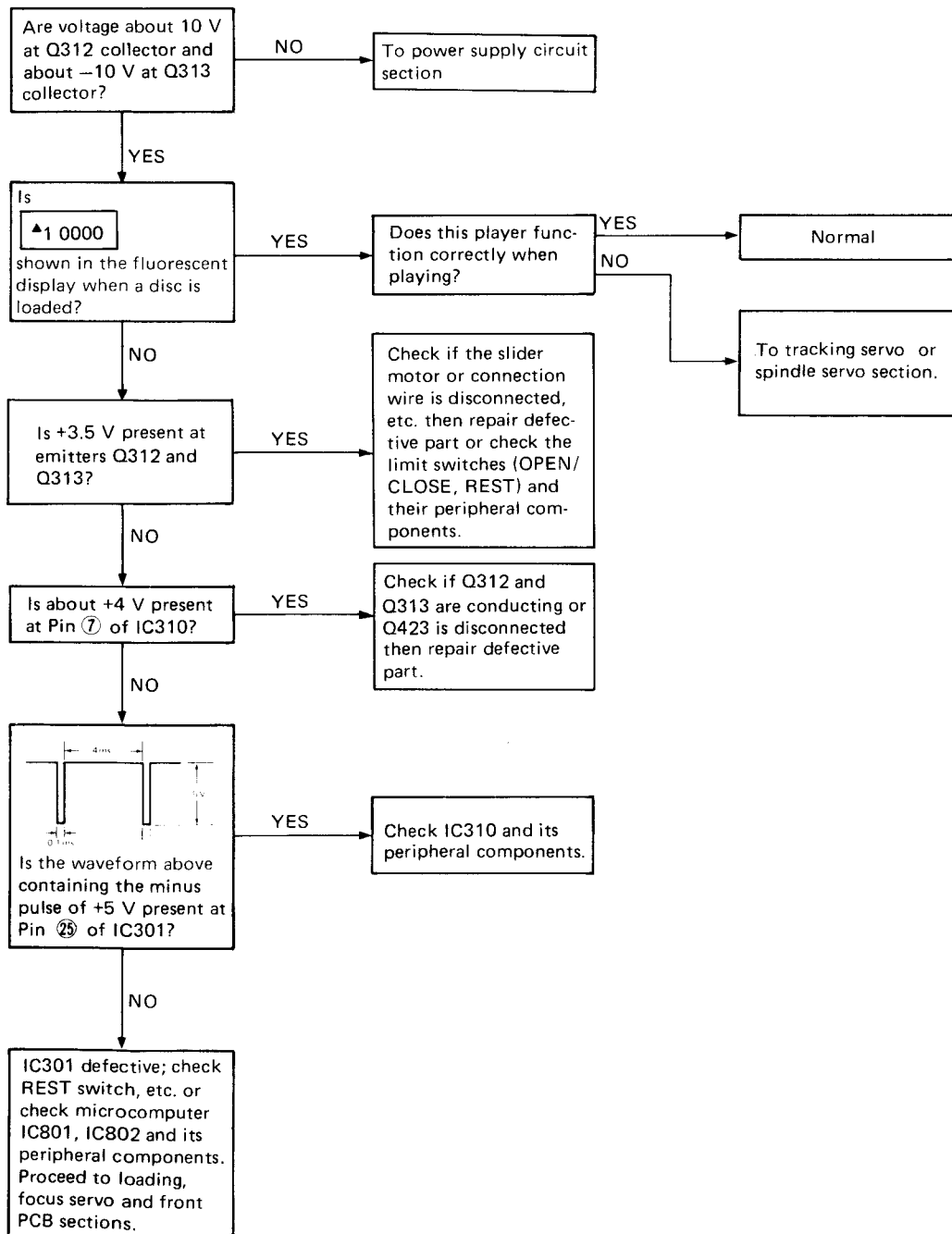
F Waveform when a disc is loaded
Shows until brake is operated after TOC has been read.

TP- ①

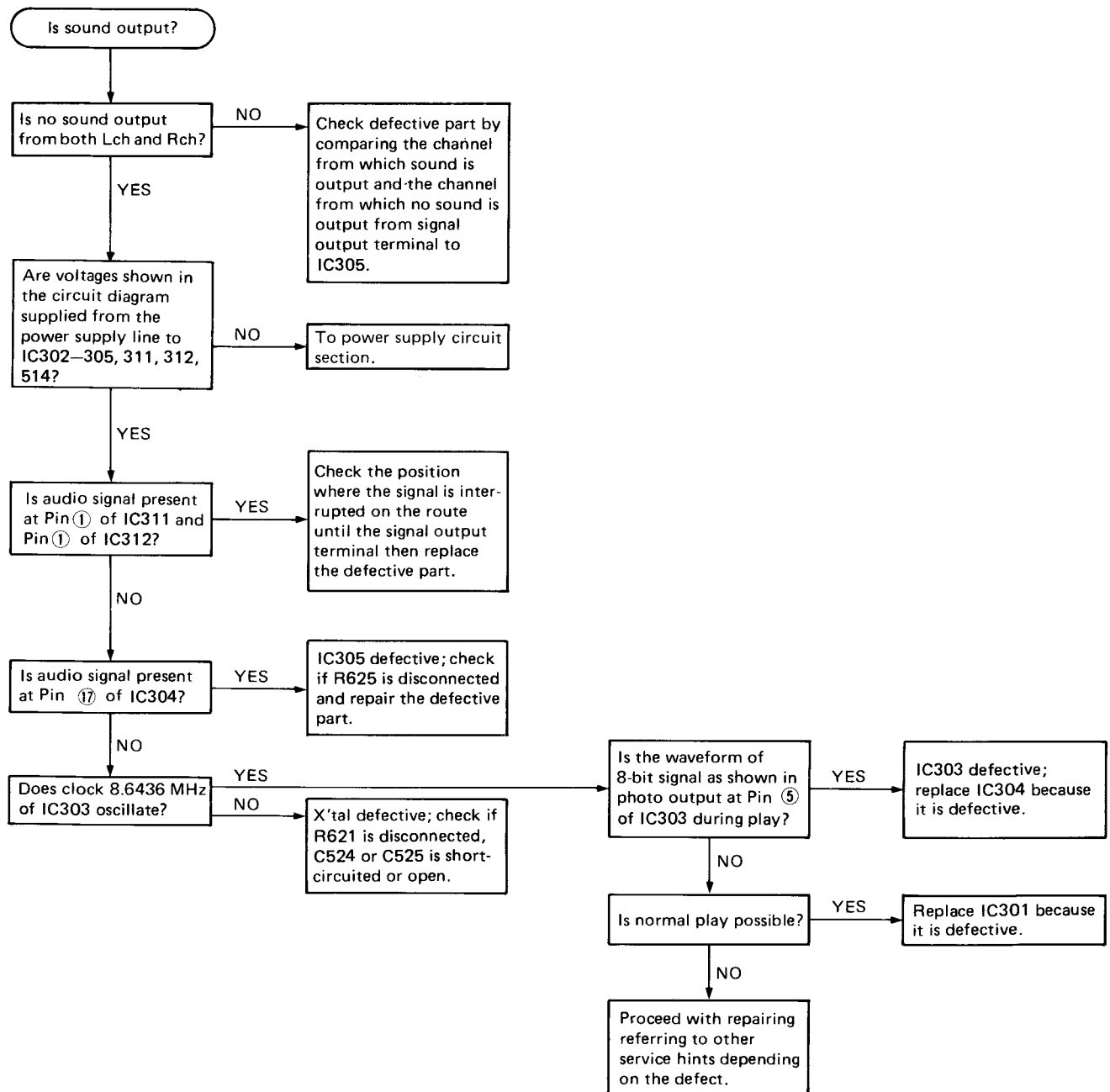


0.2 s/div 0.5 V/div

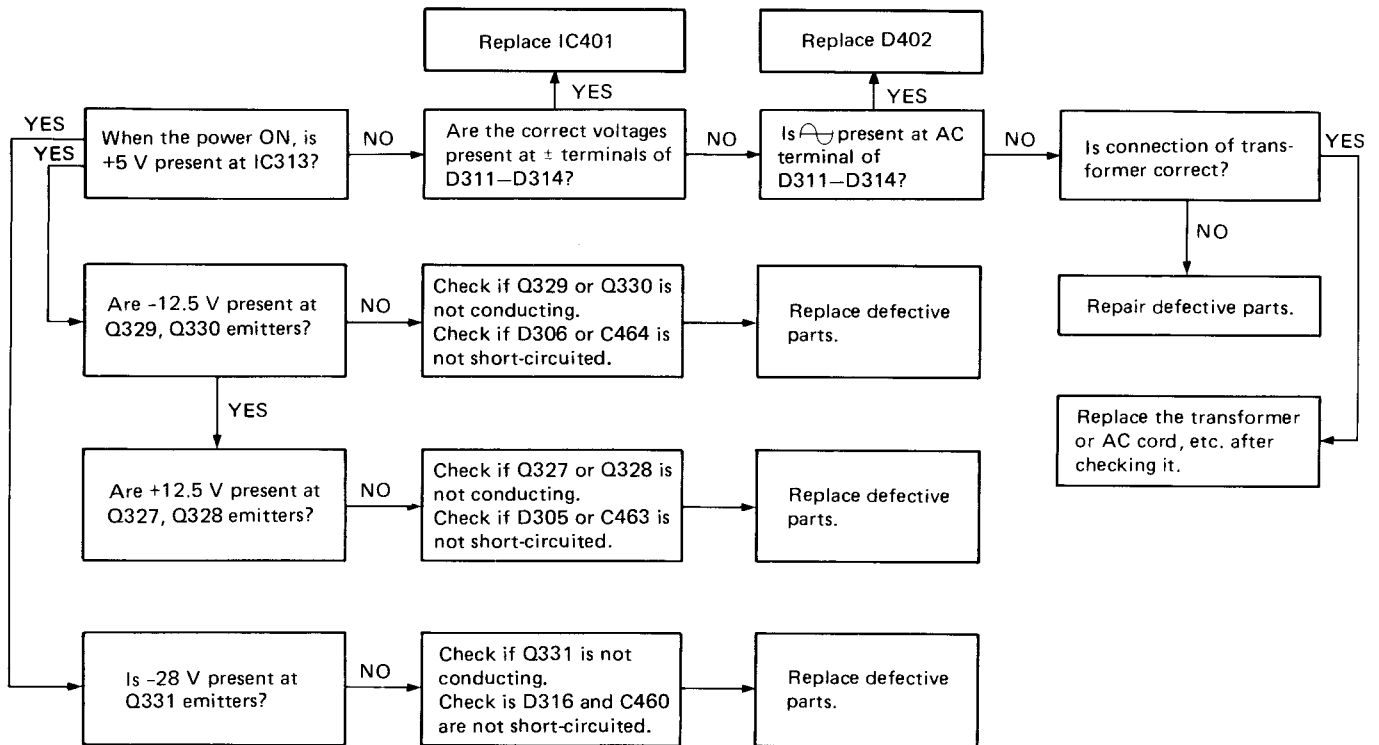
Slider servo section



Signal Processing Section



Power supply circuit section



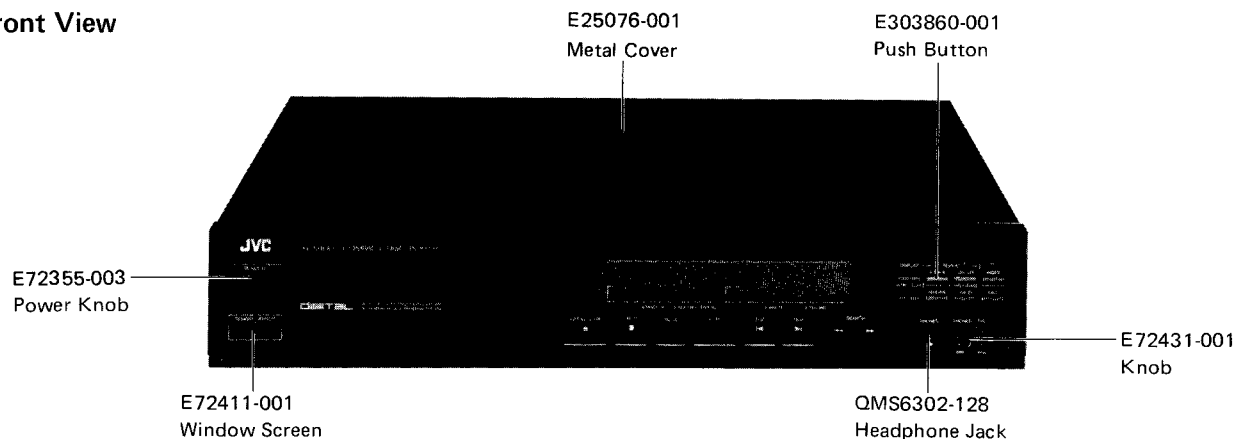
PARTS LIST

Contents

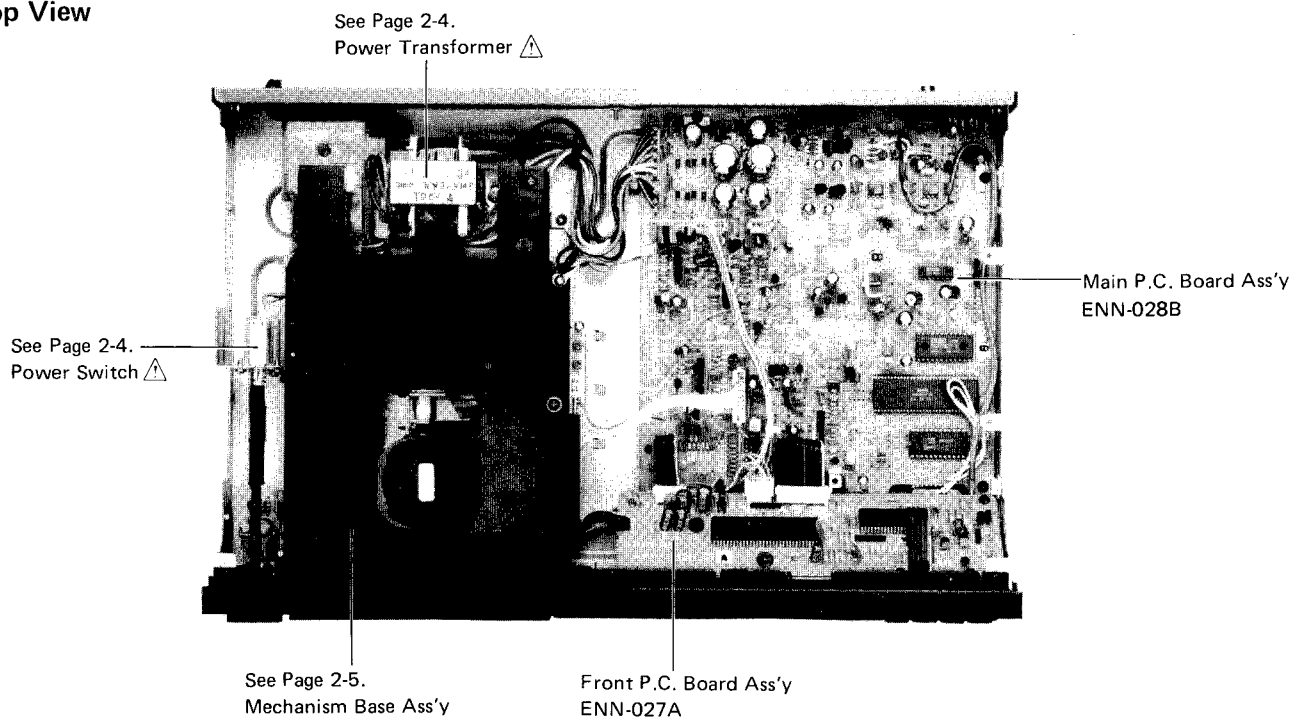
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Main Parts Locations

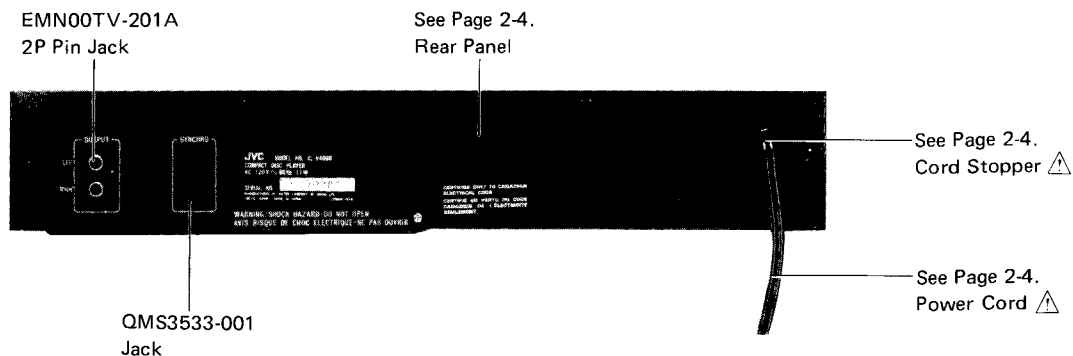
• Front View



• Top View

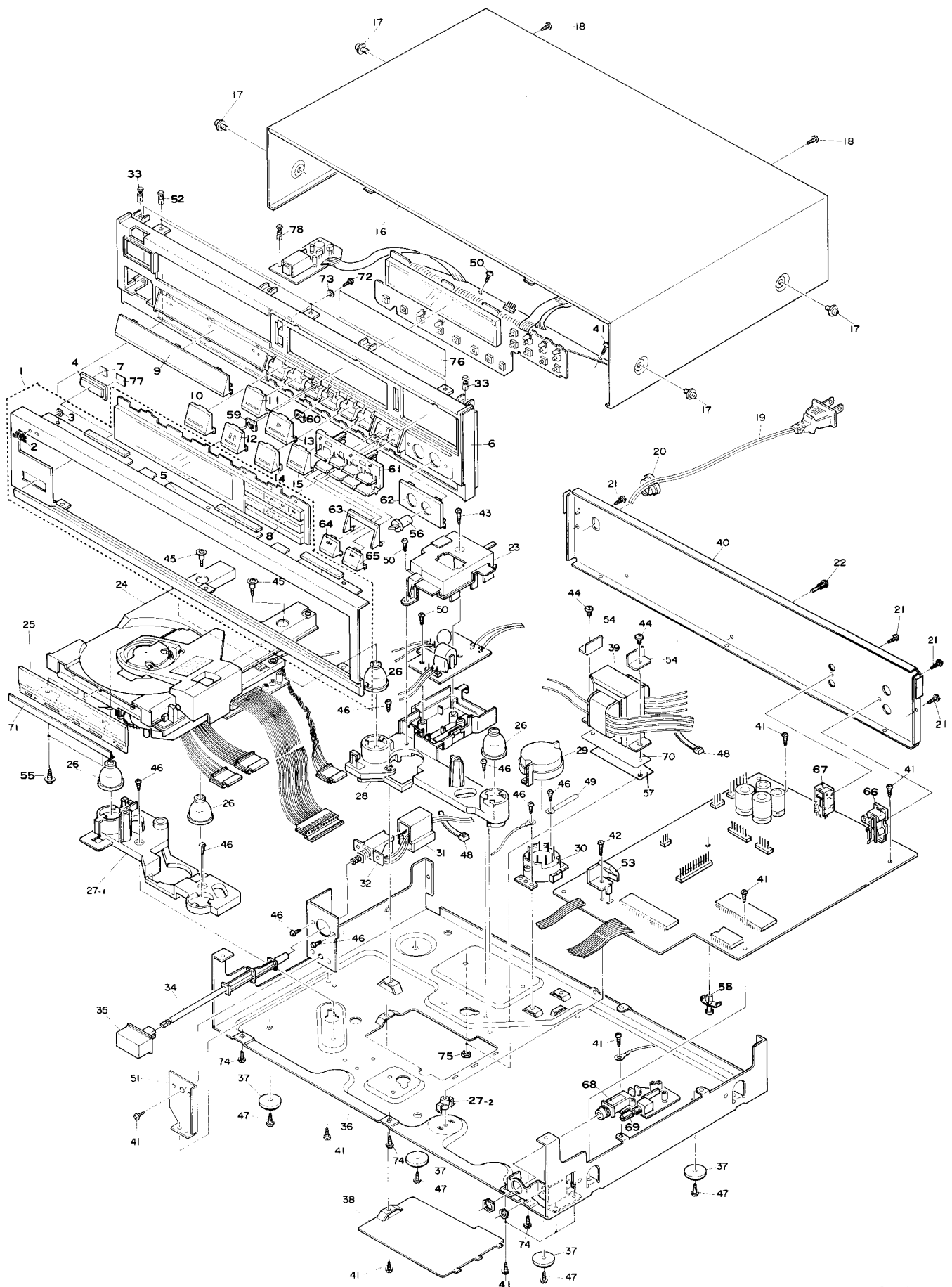


• Rear View



⚠ : Safety Parts

Exploded View and Parts List

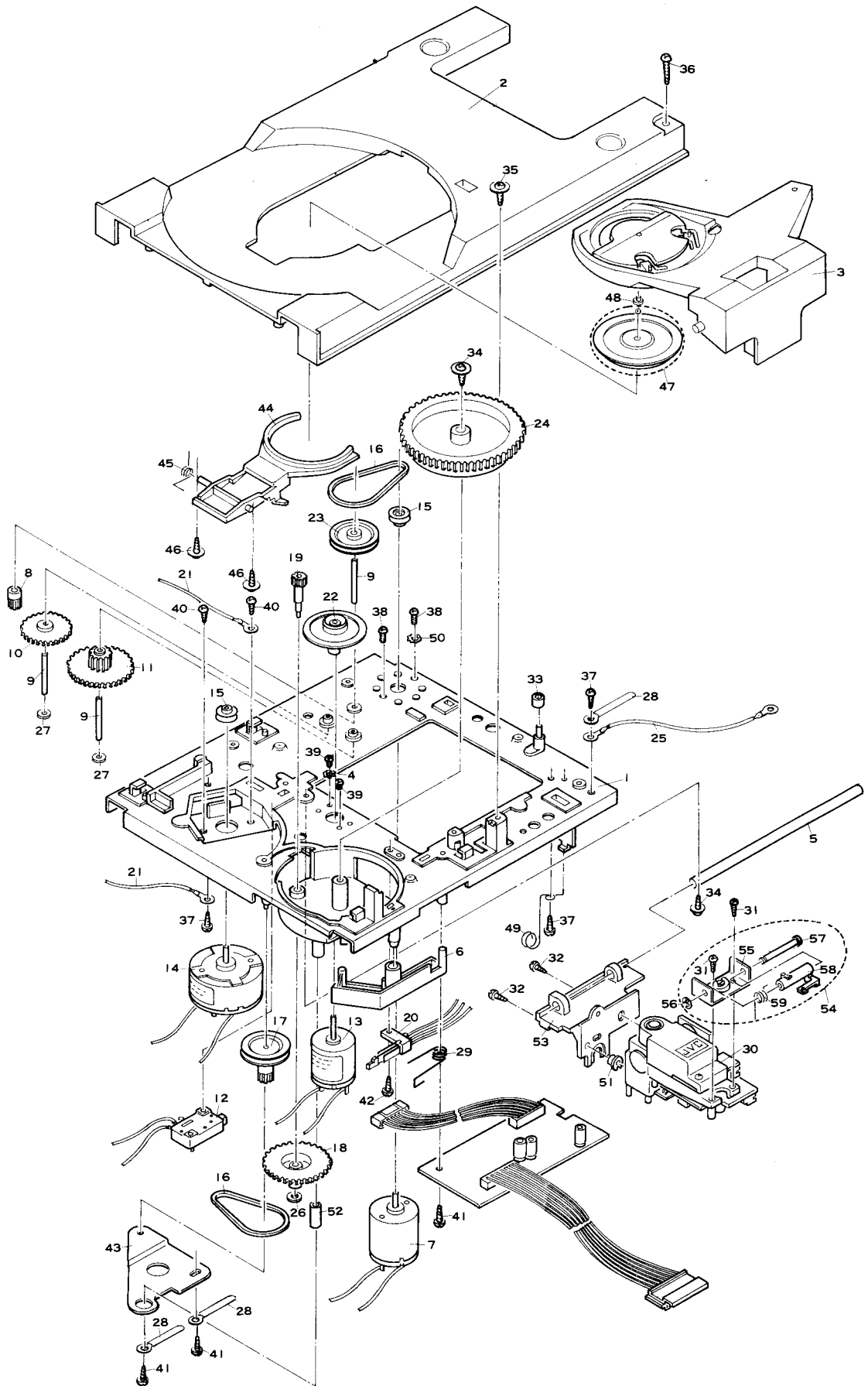


⚠	Item No.	Part Number	Part Name	Q'ty	Description	Areas
	1	EFP-XLV400BE	Front Panel Ass'y	1		
	2	E70913-001	JVC Mark	1		
	3	E60912-003	Speed Nut	1		
	4	E72411-001	Window Screen	1		
	5	E25090-001	Front Panel	1		
	6	E11168-001	Front Base	1		
	7	E70140-007	Sheet	1		
	8	E303858-001	Window Screen	1		
	9	E303861-001	Cap	1		
	10	E303862-001	Cap	1	OPEN/CLOSE	
	11	E303862-002	Cap	1	STOP	
	12	E303862-003	Cap	1	PAUSE	
	13	E303862-004	Cap	1	PLAY	
	14	E303862-005	Cap	1	SKIP ◀	
	15	E303862-006	Cap	1	SKIP ▶	
	16	E25076-001	Metal Cover	1		
	17	E61660-004	Screw	4		
	18	SHSB3008M	Screw	2		
⚠	19	QMP1200-200	Power Cord	1		J, C
⚠		QMP7600-250	Power Cord	1		U, P, PG
⚠		QMP3900-200	Power Cord	1		E, G, ES
⚠		QMP2560-244	Power Cord	1		A
⚠		QMP9017-008BS	Power Cord	1		BS
⚠	20	QHS3876-162	Cord Stopper	1		Except BS
⚠		QHS3876-162BS	Cord Stopper	1		BS
	21	SBSE3008M	Screw	4		
	22	E66052-001	Screw	1		
	23	E303842-001	Cover	1		Except J, C
		E303842-002	Cover	1		J, C
	24	E11169-003	Mechanism Base Ass'y	1		
	25	E303867-003	Tray Panel	1		
	26	E72393-001	FL. Rubber	4		
	27-1	E25081-001A	Stand (F)	1		
	27-2	E25081-002B	C.B. Holder	1		
	28	E11157-001	Stand (R)	1		Except J, C
		E11157-002	Stand (R)	1		J, C
⚠	29	E302764-001	Voltage Selector Cover	1		U, P, PG
	30	QSR0085-008U	Voltage Selector	1		U, P, PG
	31	E71004-001	Switch Cover	1		
	32	QSP1106-004	Power Switch	1		Except BS
		QSP1106-004BS	Power Switch	1		BS
	33	E48729-007	Plastic Rivet	2		
	34	E303854-001	Push Shaft	1		
	35	E72355-003	Push Knob	1		
	36	E11151-003	Chassis Base	1		Except U, P, PG
		E11151-004	Chassis Base	1		U, P, PG
	37	E47227-026	Foot	4		
	38	E303841-002	Bottom Cover	1		
⚠	39	ETP1020-12JA	Power Transformer	1		J, C
⚠		ETP1020-12MA	Power Transformer	1		U, P, PG
⚠		ETP1020-12EA	Power Transformer	1		E, A, G, ES
⚠		ETP1020-12EABS	Power Transformer	1		BS
	40	E25078-001	Rear Panel	1		J
		E25078-003	Rear Panel	1		Except J
	41	SBSE3008M	Screw	11		
	42	SBST3016Z	Screw	1		
	43	SBSF3014N	Screw	1		
	44	E65389-005	Ass'y Screw	2		
	45	E72660-001	Ass'y Screw	2		
	46	SBST3006Z	Screw	8		
	47	SDSB3008N	Screw	4		
	48	E33754-001	Tie Band	2		
	49	E72018-001	Wire Clamp	1		
	50	SBSF3008N	Screw	3		
	51	E72576-001	Bracket	1		
	52	E48729-009	Plastic Rivet	3		
	53	E72415-001	Holder	1		
	54	E72606-001	Trans. Bracket	2		
	55	E72405-001	Screw	2		
	56	E72431-001	Knob	1		
	57	E72265-001	Sheet	1		
	58	E69384-002	Fastener	1		
	59	E72413-001	Indicator	1		
	60	E72414-001	Indicator	1		
	61	E303860-001	Push Button	1		
	62	E303865-001	Cap	1		
	63	E303863-001	Cap	1	SEARCH	
	64	E303864-001	Cap	1	SKIP ◀◀	
	65	E303864-002	Cap	1	SKIP ▶▶	
	66	EMN00TV-201A	2P Pin Jack	1		
	67	QMS3533-001	Jack	1		
	68	QMS6302-128	Headphone Jack	1		
	69	QVAB99A-E54B	Variable Resistor	1		
	70	E72265-003	Sheet	1		
	71	E72418-001	PS Panel	1		
	72	GBSF3008Z	Screw	1		
	73	E71769-001	Washer	1		
	74	SDSB3008M	Screw	3		
	75	NTS4000Z	Nut	2		
	76	E303868-002	FL Screen	1		
	77	E72116-001	Screen	1		
	78	E48729-008	Plastic Rivet	1		

The Marks for Designated Areas

J U.S.A.
 C Canada
 E Europe
 A Australia
 G West Germany
 ES Spain
 BS U.K.
 P, PG . . . U.S. Military Market
 U Other Countries
 No mark indicates all areas.

Mechanism Base Ass'y



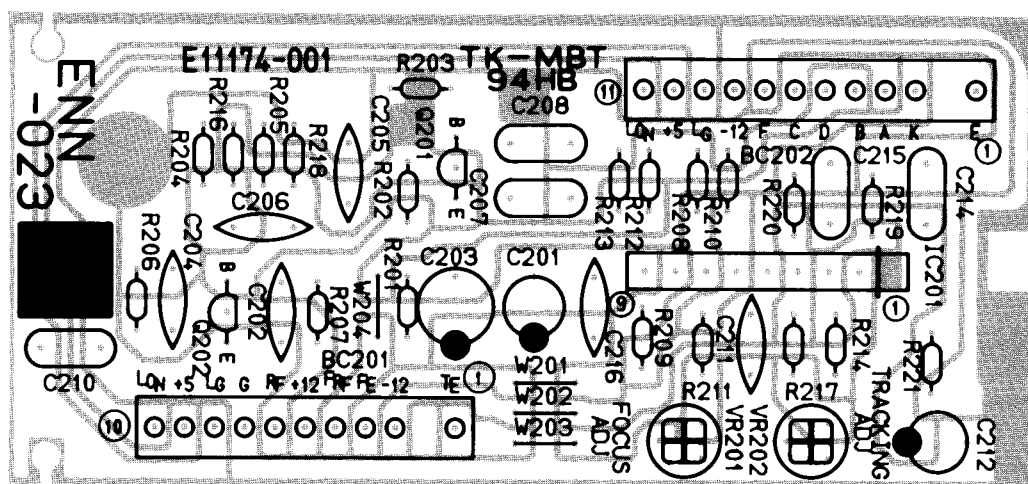
● Mechanism Base Ass'y

⚠	Item No.	Part Number	Part Name	Q'ty	Description	Areas
	1	E11148-003	Base Ass'y	1		
	2	E11149-001	Tray	1		
	3	E25068-001	Holder	1		
	4	WBS2000N	Washer	1		
	5	E71742-001	Feed Shaft	1		
	6	E303831-002	Lever	1		
	7	RF-260T-08450	Motor	1		
	8	E71733-001	Feed Gear (A)	1		
	9	E71731-002	Shaft	3		
	10	E71734-001	Feed Gear (B)	1		
	11	E303542-001	Feed Gear (C)	1		
	12	QSS1214-002	Slide Push Switch	1		
	13	VA612R53	Motor	1		
	14	E71569-001	Motor	1		
	15	E72376-001	M. Pulley	2		
	16	E69879-002	Belt	2		
	17	E72375-001	Pulley (A)	1		
	18	E72377-002	Gear (Y)	1		
	19	E72378-001	Gear (X)	1		
	20	ESB1200-001	Leaf Switch	1		
	21	EWT021-017	Terminal Wire Ass'y	1		
	22	E72379-001	Turn Table	1		
	23	E72392-001	Pulley (B)	1		
	24	E25064-002	Main Gear	1		
	25	EWT021-018	Terminal Wire Ass'y	1		
	26	E60912-001	Speed Nut	1		
	27	E72024-001	Speed Nut	2		
	28	E50670-005	Wire Clamp	3		
	29	E72382-001	Tor Spring	1		
	30	OPTIMA-1	Laser Pick Up Ass'y	1		
	31	SPSP2605N	Screw	2		
	32	SDSP2605N	Screw	2		
	33	E70267-003	R. Tube	1		
	34	E65923-003	Screw	2		
	35	E65923-004	Screw	1		
	36	SBSF3014Z	Screw	1		
	37	SBSE3008N	Screw	3		
	38	SPSP2608N	Screw	2		
	39	SDSP2003N	Screw	2		
	40	SDSP2604N	Screw	2		
	41	SBSF3008Z	Screw	3		
	42	SPSF2608Z	Screw	1		
	43	E72624-001	Gear Bracket	1		
	44	E303832-002	Lifter	1		
	45	E72381-001	Spring	1		
	46	E72405-001	Special Screw	2		
	47	E72380-002	Clamper Ass'y	1		
	48	E72408-001	Spacer	1		
	49	E72562-001	Wire Holder	1		
	50	WBS2600N	Washer	1		
	51	E72432-001	Adjust Bushing	1		
	52	E72630-001	Tube Spacer	1		
	53	E25097-001	P.U. Base (O)	1		
	54	E72409-003	Cam Bracket Unit	1		
	55	E72372-001	Cam Bracket Ass'y	1		
	56	REE1500X	E-Ring	1		
	57	E72386-001	Shaft	1		
	58	E72374-002	Adjust Lever	1		
	59	E72397-001	Spring	1		

⚠ : Safety Parts

Printed Circuit Board Ass'y and Parts List

• ENN-023B RF P.C. Board Ass'y



TRANSISTORS

ITEM	PART NUMBER	DESCRIPTION	AREA
		MAKER	
Q201	2SC458(C,D)	SILICON	HITACHI
Q202	2SC458(C,D)	SILICON	HITACHI

I. C. S

ITEM	PART NUMBER	DESCRIPTION	AREA
		MAKER	
IC201	NJM072S	I.C.	JRC

CAPACITORS

ITEM	PART NUMBER	DESCRIPTION	AREA
C201	QETB1CM-226	22MF 16V	ELECTRO
C202	QCC21EM-473	0.047MF 25V	CERAMIC
C203	QETB1CM-476	47MF 16V	ELECTRO
C204	QCS21HJ-3R0	3.0PF 50V	CERAMIC
C205	QCC21EM-473	0.047MF 25V	CERAMIC
C206	QCS21HJ-101	100PF 50V	CERAMIC
C207	QFN81HJ-472	4700PF 50V	MYLAR
C208	QFN81HJ-472	4700PF 50V	MYLAR
C210	QFV81HJ-104	0.1MF 50V	T. FILM
C211	QCC21EM-473	0.047MF 25V	CERAMIC
C212	QETB1CM-226	22MF 16V	ELECTRO
C214	QFP81HG-471	470PF 50V	POLY
C215	QFP81HG-471	470PF 50V	POLY
C216	QCC21EM-473	0.047MF 25V	CERAMIC
C217	QCS21HJ-180	18PF 50V	CERAMIC

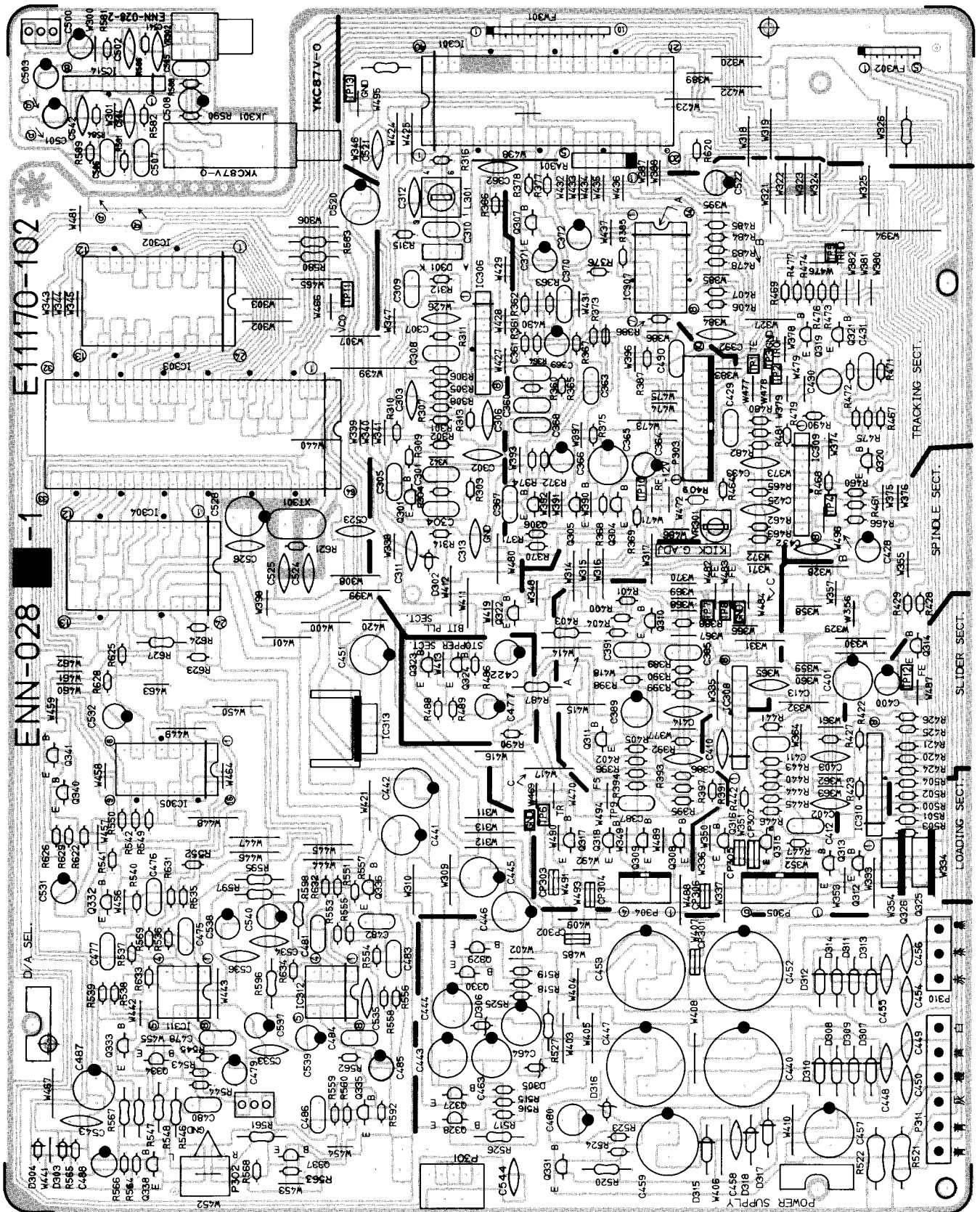
RESISTORS

ITEM	PART NUMBER	DESCRIPTION	AREA
R201	QRD161J-272	2.7K 1/6W	CARBON
R202	QRD161J-681	680 1/6W	CARBON
R203	QRD161J-103	10K 1/6W	CARBON
R204	QRD161J-681	680 1/6W	CARBON
R205	QRD161J-681	680 1/6W	CARBON
R206	QRD161J-822	8.2K 1/6W	CARBON
R207	QRD161J-122	1.2K 1/6W	CARBON
R208	QRD161J-392	3.9K 1/6W	CARBON
R209	QRV144F-2703	27 1/4W	M. FILM
R210	QRD161J-392	3.9K 1/6W	CARBON
R211	QRV144F-2203	22 1/4W	M. FILM
R212	QRD161J-564	560K 1/6W	CARBON
R213	QRD161J-564	560K 1/6W	CARBON
R214	QRD161J-624	620K 1/6W	CARBON
R216	QRD161J-183	18K 1/6W	CARBON
R217	QRD161J-514	510K 1/6W	CARBON
R218	QRD161J-391	390 1/6W	CARBON
R219	QRD161J-183	18K 1/6W	CARBON
R220	QRD161J-183	18K 1/6W	CARBON
R221	QRD161J-181	180 1/6W	CARBON
VR201	QVZ3513-104		VARIABLE
VR202	QVZ3513-224		VARIABLE

OTHERS

ITEM	PART NUMBER	DESCRIPTION	AREA
	E11174-001	CIRCUIT BOARD	

● ENN-628B Main P.C. Board Ass'y



TRANSISTORS

ITEM	PART NUMBER	DESCRIPTION		AREA
		MAKER		
Q301	2SD1302(S,T)	SILICON	MATSUSHITA	
Q304	2SA1029(C,D)	SILICON	HITACHI	
Q305	2SC458(C,D)	SILICON	HITACHI	
Q306	2SC458(C,D)	SILICON	HITACHI	
Q307	2SD1302(S,T)	SILICON	MATSUSHITA	
Q308	2SD400MP(E,F)	SILICON	SANYO	
Q309	2SB544MP(E,F)	SILICON	SANYO	
Q310	2SD1302(S,T)	SILICON	MATSUSHITA	
Q311	2SA1029(C,D)	SILICON	HITACHI	
Q312	2SD400MP(E,F)	SILICON	SANYO	
Q313	2SB544MP(E,F)	SILICON	SANYO	
Q314	2SD1302(S,T)	SILICON	MATSUSHITA	
Q315	2SD400MP(E,F)	SILICON	SANYO	
Q316	2SB544MP(E,F)	SILICON	SANYO	
Q317	2SD400MP(E,F)	SILICON	SANYO	
Q318	2SB544MP(E,F)	SILICON	SANYO	
Q319	2SD1302(S,T)	SILICON	MATSUSHITA	
Q320	2SD1302(S,T)	SILICON	MATSUSHITA	
Q321	2SD1302(S,T)	SILICON	MATSUSHITA	
Q322	2SA1029(C,D)	SILICON	HITACHI	
Q323	2SC458(C,D)	SILICON	HITACHI	
Q324	2SC458(C,D)	SILICON	HITACHI	
Q325	2SD313V(D,E)	SILICON	SANYO	
Q326	2SB507V(D,E)	SILICON	SANYO	
Q327	2SD400MP(E,F)	SILICON	SANYO	
Q328	2SD400MP(E,F)	SILICON	SANYO	
Q329	2SB544MP(E,F)	SILICON	SANYO	
Q330	2SB544MP(E,F)	SILICON	SANYO	
Q331	2SA733A(P,Q)	SILICON	NEC	
Q332	2SD1302(S,T)	SILICON	MATSUSHITA	
Q333	2SD1302(S,T)	SILICON	MATSUSHITA	
Q334	2SD1302(S,T)	SILICON	MATSUSHITA	
Q335	2SD1302(S,T)	SILICON	MATSUSHITA	
Q336	2SD1302(S,T)	SILICON	MATSUSHITA	
Q337	2SD1302(S,T)	SILICON	MATSUSHITA	
Q338	2SA1029(C,D)	SILICON	HITACHI	
Q340	DTA114YN	SILICON	ROHM	
Q341	DTC114YN	SILICON	ROHM	

I. C. S

△	ITEM	PART NUMBER	DESCRIPTION	AREA
			MAKER	
	IC301	YM3531	I.C.	YAMAHA
	IC302	UPD446C-2	I.C.	NEC
	IC303	YM2201K	I.C.	YAMAHA
	IC304	PCM53JP-V	I.C.	BURR-BROWN
	IC305	BU4053B	I.C.	ROHM
	IC306	M5219L	I.C.	MITSUBISHI
	IC307	NJM2901N	I.C.	JRC
	IC308	M5218L	I.C.	MITSUBISHI
	IC309	M5218L	I.C.	MITSUBISHI
	IC310	M5218L	I.C.	MITSUBISHI
	IC311	NJM5532D	I.C.	JRC
	IC312	NJM5532D	I.C.	JRC
	IC313	NJM78M05	I.C.	JRC
	IC514	M5218L	I.C.	MITSUBISHI

DIODES

ELECTRONIC				
△	ITEM	PART NUMBER	DESCRIPTION	AREA
				MAKER
	D301	SVC321SP-AW	VARICAP	SANYO
	D302	MTZ5.6C	ZENER	ROHM
	D303	1SS133	SILICON	ROHM
	D304	1SS133	SILICON	ROHM
	D305	MTZ13C	ZENER	ROHM
	D306	MTZ13C	ZENER	ROHM
	D307	11E2TA1	SILICON	NIHONINTER
	D308	11E2TA1	SILICON	NIHONINTER
	D309	11E2TA1	SILICON	NIHONINTER
	D310	11E2TA1	SILICON	NIHONINTER

DIODES

△	ITEM	PART NUMBER	DESCRIPTION		AREA
				MAKER	
	D311	11E2TA1	SILICON	NIHONINTER	
	D312	11E2TA1	SILICON	NIHONINTER	
	D313	11E2TA1	SILICON	NIHONINTER	
	D314	11E2TA1	SILICON	NIHONINTER	
	D315	11E2TA1	SILICON	NIHONINTER	
	D316	MTZ30A	ZENER	ROHM	
	D317	11E2TA1	SILICON	NIHONINTER	
	D318	11E2TA1	SILICON	NIHONINTER	

CAPACITORS

ITEM	PART NUMBER	DESCRIPTION			AREA
C301	QFV81HJ-224	0.22MF	50V	T.FILM	
C302	QCS21HJ-471	470PF	50V	CERAMIC	
C303	QCS21HJ-471	470PF	50V	CERAMIC	
C304	QFN81HJ-103	0.01MF	50V	MYLAR	
C305	QFV81HJ-104	0.1MF	50V	T.FILM	
C306	QCF21HP-473	0.047MF	50V	CERAMIC	
C307	QCS21HJ-100	10PF	50V	CERAMIC	
C308	QFN81HJ-273	0.027MF	50V	MYLAR	
C309	QFP81HJ-471	470PF	50V	POLY	
C310	QFP81HJ-151	150PF	50V	POLY	
C311	QCF21HP-473	0.047MF	50V	CERAMIC	
C312	QCF21HP-473	0.047MF	50V	CERAMIC	
C313	QCF21HP-223	0.022MF	50V	CERAMIC	
C360	QFN81HJ-103	0.01MF	50V	MYLAR	
C361	QFN81HJ-152	1500PF	50V	MYLAR	
C362	QCS21HJ-151	150PF	50V	CERAMIC	
C363	QFV81HJ-224	0.22MF	50V	T.FILM	
C364	QETB1EM-106	10MF	25V	ELECTRO	
C365	QETB1CM-107	100MF	16V	ELECTRO	
C366	QETB1EM-106	10MF	25V	ELECTRO	
C367	QFN81HJ-473	0.047MF	50V	MYLAR	
C368	QFN81HJ-222	2200PF	50V	MYLAR	
C369	QETB1EM-106	10MF	25V	ELECTRO	
C370	QFN81HJ-183	0.018MF	50V	MYLAR	
C371	QETB1HM-475	4.7MF	50V	ELECTRO	
C372	QETB1EM-106	10MF	25V	ELECTRO	
C385	QFN81HJ-183	0.018MF	50V	MYLAR	
C386	QCS21HJ-271	270PF	50V	CERAMIC	
C387	QFN81HJ-104	0.1MF	50V	MYLAR	
C389	QETB1AM-476	47MF	10V	ELECTRO	
C392	QCF21HP-223	0.022MF	50V	CERAMIC	
C400	QETB1EM-106	10MF	25V	ELECTRO	
C401	QETB0JM-227	220MF	6.3V	ELECTRO	
C402	QCF21HP-223	0.022MF	50V	CERAMIC	
C403	QCF21HP-223	0.022MF	50V	CERAMIC	
C410	QCS21HJ-221	220PF	50V	CERAMIC	
C411	QFN81HJ-472	4700PF	50V	MYLAR	
C412	QFV81HJ-474	0.47MF	50V	T.FILM	
C413	QCF21HP-223	0.022MF	50V	CERAMIC	
C414	QCF21HP-223	0.022MF	50V	CERAMIC	
C422	QETB1HM-475	4.7MF	50V	ELECTRO	
C425	QCS21HJ-100	10PF	50V	CERAMIC	
C428	QETB1HM-474	0.47MF	50V	ELECTRO	
C429	QFN81HJ-273	0.027MF	50V	MYLAR	
C430	QEN51HM-225	2.2MF	50V	NON POLE	
C431	QFN81HJ-393	0.039MF	50V	MYLAR	
C432	QCF21HP-223	0.022MF	50V	CERAMIC	
C433	QCF21HP-223	0.022MF	50V	CERAMIC	
C440	QETB1EM-338	3300MF	25V	ELECTRO	
C441	QETB1CM-227	220MF	16V	ELECTRO	
C442	QETB1CM-227	220MF	16V	ELECTRO	
C443	QETB1CM-476	47MF	16V	ELECTRO	
C444	QETB1CM-476	47MF	16V	ELECTRO	
C445	QETB1CM-476	47MF	16V	ELECTRO	
C446	QETB1CM-476	47MF	16V	ELECTRO	
C447	QETB1EM-338	3300MF	25V	ELECTRO	
C448	QCF21HP-223	0.022MF	50V	CERAMIC	
C449	QCF21HP-223	0.022MF	50V	CERAMIC	
C450	QCF21HP-223	0.022MF	50V	CERAMIC	
C451	QETB1AM-107	100MF	10V	ELECTRO	
C452	QETB1CM-228	2200MF	16V	ELECTRO	
C453	QETB1CM-228	2200MF	16V	ELECTRO	
C454	QCF21HP-223	0.022MF	50V	CERAMIC	
C455	QCF21HP-223	0.022MF	50V	CERAMIC	
C456	QCF21HP-223	0.022MF	50V	CERAMIC	

CAPACITORS

ITEM	PART NUMBER	DESCRIPTION	AREA
C457	QETB1VM-477	470MF 35V ELECTRO	
C458	QCF21HP-223	0.022MF 50V CERAMIC	
C459	QETB1HM-477	470MF 50V ELECTRO	
C460	QETB1HM-476	47MF 50V ELECTRO	
C463	QETB1CM-476	47MF 16V ELECTRO	
C464	QETB1CM-476	47MF 16V ELECTRO	
C475	QFP81HJ-271	270PF 50V POLY	
C476	QFN81HJ-473	0.047MF 50V MYLAR	
C477	QETB1HM-475	4.7MF 50V ELECTRO	
C478	QFP81HJ-271	270PF 50V POLY	
C479	QETB1CM-476	47MF 16V ELECTRO	
C480	QFN81HJ-822	8200PF 50V MYLAR	
C481	QFP81HJ-271	270PF 50V POLY	
C482	QFN81HJ-473	0.047MF 50V MYLAR	
C483	QFN81HJ-123	0.012MF 50V MYLAR	
C484	QFP81HJ-271	270PF 50V POLY	
C485	QETB1CM-476	47MF 16V ELECTRO	
C486	QFN81HJ-822	8200PF 50V MYLAR	
C487	QETB1CM-227	220MF 16V ELECTRO	
C488	QETB1EM-106	10MF 25V ELECTRO	
C490	QFN81HJ-104	0.1MF 50V MYLAR	
C500	QETB1EM-106	10MF 25V ELECTRO	
C501	QETB1CM-476	47MF 16V ELECTRO	
C502	QCS21HJ-101	100PF 50V CERAMIC	
C503	QETB1CM-476	47MF 16V ELECTRO	
C504	QCS21HJ-101	100PF 50V CERAMIC	
C505	QFN81HJ-103	0.01MF 50V MYLAR	
C506	QFN81HJ-103	0.01MF 50V MYLAR	
C507	QFN81HJ-103	0.01MF 50V MYLAR	
C508	QETB1EM-106	10MF 25V ELECTRO	
C520	QETB1AM-476	47MF 10V ELECTRO	
C521	QCF21HP-473	0.047MF 50V CERAMIC	
C522	QETB1HM-474	0.47MF 50V ELECTRO	
C523	QCF21HP-473	0.047MF 50V CERAMIC	
C524	QCS21HJ-100	10PF 50V CERAMIC	
C525	QCS21HJ-100	10PF 50V CERAMIC	
C526	QCF21HP-223	0.022MF 50V CERAMIC	
C528	QETBOJM-227	220MF 6.3V ELECTRO	
C531	QETBOJM-477	470MF 6.3V ELECTRO	
C532	QETB1CM-227	220MF 16V ELECTRO	
C533	QCF21HP-223	0.022MF 50V CERAMIC	
C534	QCF21HP-223	0.022MF 50V CERAMIC	
C535	QCF21HP-223	0.022MF 50V CERAMIC	
C536	QCF21HP-223	0.022MF 50V CERAMIC	
C537	QETB1CM-476	47MF 16V ELECTRO	
C538	QETB1CM-476	47MF 16V ELECTRO	
C539	QETB1CM-476	47MF 16V ELECTRO	
C540	QETB1CM-476	47MF 16V ELECTRO	
C541	QCS21HJ-101	100PF 50V CERAMIC	
C542	QCS21HJ-101	100PF 50V CERAMIC	
C543	QCF21HP-103	0.01MF 50V CERAMIC	
C544	QCS21HJ-470	47PF 50V CERAMIC	
C545	QFN81HJ-103	0.01MF 50V MYLAR	
C546	QCS21HJ-101	100PF 50V CERAMIC	
C547	QETB1EM-106	10MF 25V ELECTRO	

RESISTORS

ITEM	PART NUMBER	DESCRIPTION	AREA
R301	QRD161J-271	270 1/6W CARBON	
R302	QRD161J-182	1.8K 1/6W CARBON	
R303	QRD161J-182	1.8K 1/6W CARBON	
R304	QRD161J-181	180 1/6W CARBON	
R305	QRD161J-562	5.6K 1/6W CARBON	
R306	QRD161J-183	18K 1/6W CARBON	
R307	QRV144F-3302	33K 1/4W M.FILM	
R308	QRD161J-182	1.8K 1/6W CARBON	
R309	QRD161J-562	5.6K 1/6W CARBON	
R310	QRD161J-562	5.6K 1/6W CARBON	
R311	QRD161J-183	18K 1/6W CARBON	
R312	QRD161J-471	470 1/6W CARBON	
R313	QRV144F-3302	33K 1/4W M.FILM	
R314	QRD161J-562	5.6K 1/6W CARBON	
R315	QRD161J-104	100K 1/6W CARBON	

RESISTORS

ITEM	PART NUMBER	DESCRIPTION	AREA
R316	QRD161J-821	820 1/6W CARBON	
R360	QRD161J-104	100K 1/6W CARBON	
R364	QRD161J-562	5.6K 1/6W CARBON	
R362	QRD161J-562	5.6K 1/6W CARBON	
R363	QRD161J-181	180 1/6W CARBON	
R364	QRD161J-103	10K 1/6W CARBON	
R365	QRD161J-473	47K 1/6W CARBON	
R366	QRD161J-472	4.7K 1/6W CARBON	
R367	QRD161J-471	470 1/6W CARBON	
R368	QRD161J-272	2.7K 1/6W CARBON	
R369	QRD161J-103	10K 1/6W CARBON	
R370	QRD161J-103	10K 1/6W CARBON	
R371	QRD161J-562	5.6K 1/6W CARBON	
R372	QRD161J-103	10K 1/6W CARBON	
R373	QRD161J-103	10K 1/6W CARBON	
R374	QRD161J-103	10K 1/6W CARBON	
R375	QRD161J-271	270 1/6W CARBON	
R376	QRD161J-104	100K 1/6W CARBON	
R377	QRD161J-562	5.6K 1/6W CARBON	
R378	QRD161J-562	5.6K 1/6W CARBON	
R385	QRD161J-562	5.6K 1/6W CARBON	
R386	QRD161J-104	100K 1/6W CARBON	
R387	QRD161J-562	5.6K 1/6W CARBON	
R388	QRD161J-102	1K 1/6W CARBON	
R389	QRD161J-393	39K 1/6W CARBON	
R390	QRD161J-471	470 1/6W CARBON	
R391	QRD161J-470	47 1/6W CARBON	
R392	QRD161J-223	22K 1/6W CARBON	
R394	QRD161J-154	150K 1/6W CARBON	
R395	QRD161J-155	1.5M 1/6W CARBON	
R396	QRD161J-155	1.5M 1/6W CARBON	
R397	QRD161J-564	560K 1/6W CARBON	
R399	QRD161J-333	33K 1/6W CARBON	
R400	QRD161J-103	10K 1/6W CARBON	
R401	QRD161J-104	100K 1/6W CARBON	
R402	QRD161J-473	47K 1/6W CARBON	
R403	QRD148J-104S	100K 1/4W CARBON	
R404	QRD161J-272	2.7K 1/6W CARBON	
R405	QRD161J-470	47 1/6W CARBON	
R406	QRD161J-104	100K 1/6W CARBON	
R407	QRD161J-562	5.6K 1/6W CARBON	
R409	QRD161J-114	110K 1/6W CARBON	
R420	QRD161J-154	150K 1/6W CARBON	
R421	QRD161J-154	150K 1/6W CARBON	
R422	QRD161J-184	180K 1/6W CARBON	
R423	QRD161J-470	47 1/6W CARBON	
R424	QRD161J-103	10K 1/6W CARBON	
R425	QRD161J-182	1.8K 1/6W CARBON	
R426	QRD161J-821	820 1/6W CARBON	
R427	QRD161J-103	10K 1/6W CARBON	
R428	QRD161J-103	10K 1/6W CARBON	
R440	QRD161J-684	680K 1/6W CARBON	
R441	QRD161J-684	680K 1/6W CARBON	
R442	QRD161J-470	47 1/6W CARBON	
R443	QRD161J-104	100K 1/6W CARBON	
R444	QRD161J-563	56K 1/6W CARBON	
R445	QRD161J-473	47K 1/6W CARBON	
R446	QRD161J-472	4.7K 1/6W CARBON	
R447	QRD145J-2R7S	2.7 1/4W UNF. CARBON	
R460	QRD161J-394	390K 1/6W CARBON	
R461	QRD161J-394	390K 1/6W CARBON	
R462	QRD161J-154	150K 1/6W CARBON	
R463	QRD161J-470	47 1/6W CARBON	
R464	QRD161J-472	4.7K 1/6W CARBON	
R465	QRD161J-163	16K 1/6W CARBON	
R466	QRD161J-155	1.5M 1/6W CARBON	
R467	QRD161J-103	10K 1/6W CARBON	
R468	QRD161J-183	18K 1/6W CARBON	
R469	QRD161J-103	10K 1/6W CARBON	
R471	QRD161J-102	1K 1/6W CARBON	
R472	QRD161J-122	1.2K 1/6W CARBON	
R473	QRD161J-103	10K 1/6W CARBON	
R474	QRD161J-104	100K 1/6W CARBON	
R475	QRD161J-104	100K 1/6W CARBON	
R476	QRD161J-104	100K 1/6W CARBON	
R477	QRD161J-103	10K 1/6W CARBON	
R478	QRD161J-562	5.6K 1/6W CARBON	
R479	QRD161J-153	15K 1/6W CARBON	
R480	QRD161J-561	560 1/6W CARBON	
R481	QRD161J-223	22K 1/6W CARBON	
R482	QRD161J-103	10K 1/6W CARBON	
R483	QRD161J-562	5.6K 1/6W CARBON	
R484	QRD161J-562	5.6K 1/6W CARBON	
R485	QRD161J-562	5.6K 1/6W CARBON	

△ : SAFETY PARTS

RESISTORS

ITEM	PART NUMBER	DESCRIPTION	AREA
R486	QRD161J-471	470 1/6W CARBON	
R487	QRD148J-104S	100K 1/4W CARBON	
R488	QRD161J-183	18K 1/6W CARBON	
R489	QRD161J-682	6.8K 1/6W CARBON	
R490	QRD161J-123	12K 1/6W CARBON	
R500	QRD161J-563	56K 1/6W CARBON	
R501	QRD161J-104	100K 1/6W CARBON	
R502	QRD161J-563	56K 1/6W CARBON	
R503	QRD161J-470	47 1/6W CARBON	
R504	QRD161J-104	100K 1/6W CARBON	
R515	QRD161J-121	120 1/6W CARBON	
R516	QRD161J-121	120 1/6W CARBON	
R517	QRD161J-122	1.2K 1/6W CARBON	
R518	QRD161J-121	120 1/6W CARBON	
R519	QRD161J-122	1.2K 1/6W CARBON	
R520	QRZ0062-560M	56 1/4W FUSIBLE	
R521	QRD125J-102	1K 1/2W UNF. CARBON	
R522	QRD125J-102	1K 1/2W UNF. CARBON	
R523	QRD161J-121	120 1/6W CARBON	
R524	QRD161J-123	12K 1/6W CARBON	
R525	QRD161J-121	120 1/6W CARBON	
R526	QRZ0062-100	10 1/4W FUSIBLE	
R527	QRZ0062-100	10 1/4W FUSIBLE	
R535	QRD161J-822	8.2K 1/6W CARBON	
R536	QRD161J-152	1.5K 1/6W CARBON	
R537	QRD161J-152	1.5K 1/6W CARBON	
R538	QRD161J-472	4.7K 1/6W CARBON	
R539	QRD161J-272	2.7K 1/6W CARBON	
R540	QRD161J-474	470K 1/6W CARBON	
R541	QRD161J-682	6.8K 1/6W CARBON	
R542	QRD161J-472	4.7K 1/6W CARBON	
R543	QRD161J-102	1K 1/6W CARBON	
R544	QRD161J-561	560 1/6W CARBON	
R545	QRD161J-273	27K 1/6W CARBON	
R546	QRD148J-101S	100 1/4W CARBON	
R547	QRD148J-103S	10K 1/4W CARBON	
R548	QRD148J-103S	10K 1/4W CARBON	
R549	QRD161J-472	4.7K 1/6W CARBON	
R550	QRD161J-472	4.7K 1/6W CARBON	
R551	QRD161J-822	8.2K 1/6W CARBON	
R552	QRD161J-682	6.8K 1/6W CARBON	
R553	QRD161J-152	1.5K 1/6W CARBON	
R554	QRD161J-152	1.5K 1/6W CARBON	
R555	QRD161J-331	330 1/6W CARBON	
R556	QRD161J-472	4.7K 1/6W CARBON	
R557	QRD161J-474	470K 1/6W CARBON	
R558	QRD161J-272	2.7K 1/6W CARBON	
R559	QRD161J-561	560 1/6W CARBON	
R560	QRD161J-103	10K 1/6W CARBON	
R561	QRD148J-101S	100 1/4W CARBON	
R562	QRD161J-273	27K 1/6W CARBON	
R563	QRD161J-103	10K 1/6W CARBON	
R564	QRD161J-103	10K 1/6W CARBON	
R565	QRD161J-680	68 1/6W CARBON	
R566	QRD161J-273	27K 1/6W CARBON	
R567	QRD148J-334S	330K 1/4W CARBON	
R568	QRD161J-684	680K 1/6W CARBON	
R569	QRD161J-331	330 1/6W CARBON	
R580	QRZ0062-221	220 1/4W FUSIBLE	
R581	QRD161J-473	47K 1/6W CARBON	
R582	QRD161J-473	47K 1/6W CARBON	
R583	QRZ0062-221	220 1/4W FUSIBLE	
R584	QRD161J-473	47K 1/6W CARBON	
R586	QRD161J-473	47K 1/6W CARBON	
R588	QRD161J-680	68 1/6W CARBON	
R589	QRD161J-680	68 1/6W CARBON	
R590	QRD161J-390	39 1/6W CARBON	
R591	QRD161J-390	39 1/6W CARBON	
R592	QRD161J-102	1K 1/6W CARBON	
R595	QRD148J-101S	100 1/4W CARBON	
R596	QRD148J-101S	100 1/4W CARBON	
R597	QRD148J-101S	100 1/4W CARBON	
R598	QRD148J-101S	100 1/4W CARBON	
R620	QRD161J-103	10K 1/6W CARBON	
R621	QRD161J-105	1M 1/6W CARBON	
R622	QRD161J-101	100 1/6W CARBON	
R623	QRD161J-123	12K 1/6W CARBON	
R624	QRD161J-105	1M 1/6W CARBON	
R625	QRD161J-183	18K 1/6W CARBON	
R626	QRD161J-124	120K 1/6W CARBON	
R627	QRD148J-273S	27K 1/4W CARBON	
R628	QRD161J-101	100 1/6W CARBON	
R629	QRD161J-104	100K 1/6W CARBON	
R631	QRD161J-471	470 1/6W CARBON	

△ : SAFETY PARTS

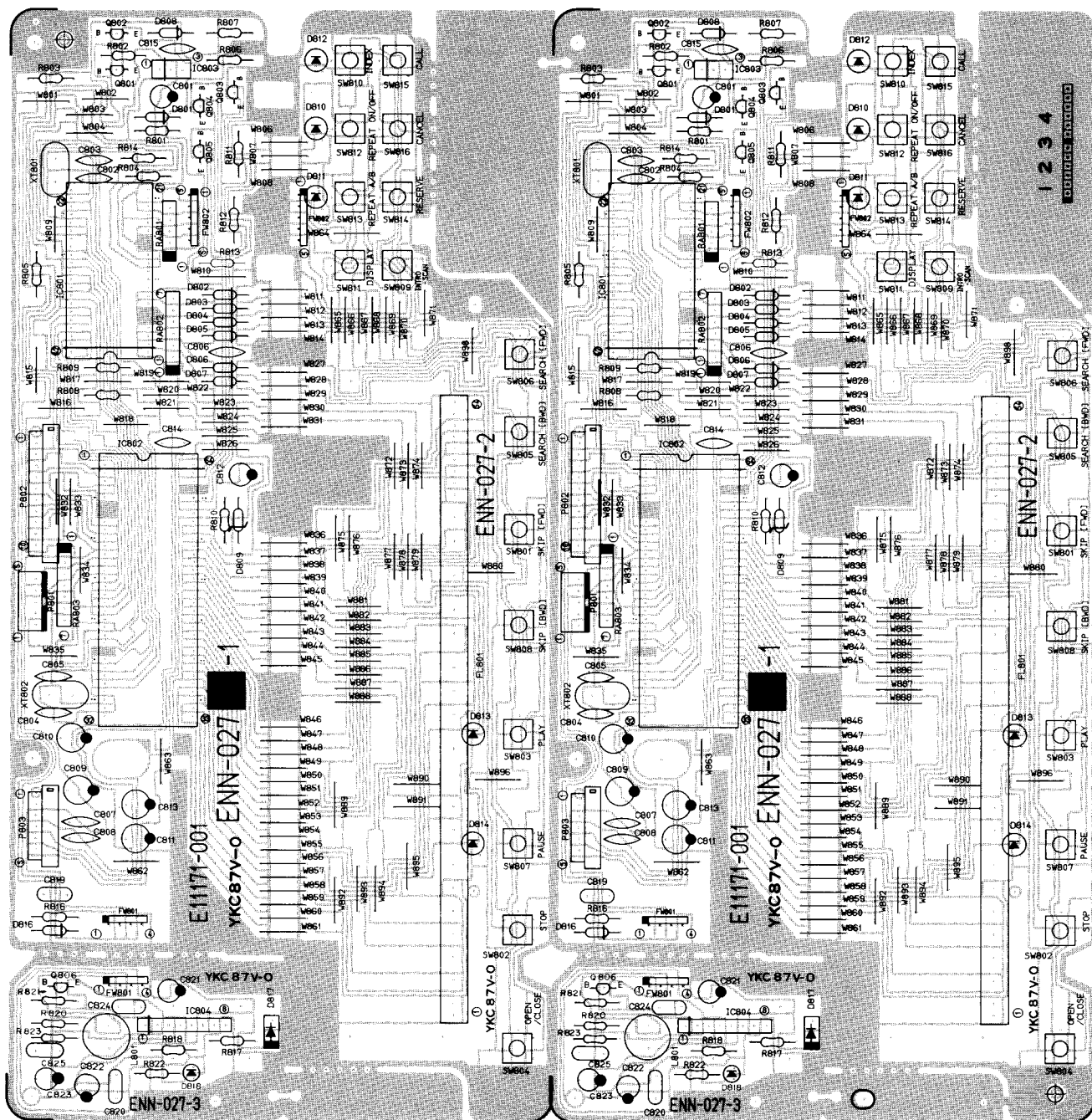
RESISTORS

ITEM	PART NUMBER	DESCRIPTION	AREA
R632	QRD161J-471	470 1/6W CARBON	
R633	QRD161J-103	10K 1/6W CARBON	
R634	QRD161J-103	10K 1/6W CARBON	
R635	QRD161J-105	1M 1/6W CARBON	
R636	QRD161J-472	4.7K 1/6W CARBON	
R637	QRD148J-333S	33K 1/4W CARBON	
R638	QRD148J-333S	33K 1/4W CARBON	
R639	QRD148J-183S	18K 1/4W CARBON	
RA301	QRB045J-472	4.7K ARRAY	
VR301	QVZ3518-472	VARIABLE	
VR302	QVAB99A-E54B	VARIABLE	

OTHERS

ITEM	PART NUMBER	DESCRIPTION	AREA
	EWT011-078	TERMINAL WIRE	
	E11170-101	CIRCUIT BOARD	
	E70306-001	HEAT SINK	
	E70859-001	EARTH PLATE	
	SBSB3008M	SCREW	
L301	ENZ3001-002	OSC.COIL	
P301	QMS3533-001	JACK ASSY	
P302	EMN00TV-201A	PIN JACK ASSY	
P303	QMV5005-010	PULAG ASSY	
P304	QMV5005-004	PULAG ASSY	
P305	QMV5005-006	PULAG ASSY	
P310	E67764-003	TERMINAL	
P311	E67764-006	R. TERMINAL	
CP301	ICP-F20	ICP	
CP302	ICP-F20	ICP	
CP303	ICP-F10	ICP	
CP304	ICP-F10	ICP	
CP307	ICP-F10	ICP	
JK301	QMS6302-128	JACK ASSY	
XT301	ECX0086-436EC	CRYSTAL	

● ENN-027A Front P.C. Board Ass'y



TRANSISTORS

ITEM	PART NUMBER	DESCRIPTION			AREA
		MAKER			
Q801	DTC114YN	SILICON	ROHM		
Q802	DTC114YN	SILICON	ROHM		
Q803	DTA114YN	SILICON	ROHM		
Q804	DTA114YN	SILICON	ROHM		
Q805	DTA114YN	SILICON	ROHM		
Q806	DTC114YN	SILICON	ROHM		

I. C. S

ITEM	PART NUMBER	DESCRIPTION		AREA
			MAKER	
IC801	UPD1511ACU-607	I.C.	NEC	
IC802	UPD7519CW-209	I.C.	NEC	
IC803	MN1280(P,Q)	I.C.	MATSUSHITA	
IC804	UPC1473HA	I.C.	NEC	

DIODES

ITEM	PART NUMBER	DESCRIPTION		AREA
		MAKER		
D801	1S2473	SILICON	ROHM	
D802	1S2473	SILICON	ROHM	
D803	1S2473	SILICON	ROHM	
D804	1S2473	SILICON	ROHM	
D805	1S2473	SILICON	ROHM	
D806	1S2473	SILICON	ROHM	
D807	1S2473	SILICON	ROHM	
D808	1S2473	SILICON	ROHM	
D809	RD9.1EB3	ZENER	NEC	
D810	SLR-34VC50F	L.E.D.	ROHM	
D811	SLR-34VC50F	L.E.D.	ROHM	
D812	SLR-34VC50F	L.E.D.	ROHM	
D813	SLR-34DC50F	L.E.D.	ROHM	
D814	SLR-34VC50F	L.E.D.	ROHM	
D816	1S2473	SILICON	ROHM	
D817	PH302B	SILICON	NEC	
D818	SLH-56VC32	L.E.D.	ROHM	

CAPACITORS

C O M P O N E N T S					AREA
ITEM	PART NUMBER	DESCRIPTION			AREA
C801	QETB1AM-107	100MF	10V	ELECTRO	
C802	QCS21HJ-680	68PF	50V	CERAMIC	
C803	QCS21HJ-680	68PF	50V	CERAMIC	
C804	QCS21HJ-150	15PF	50V	CERAMIC	
C805	QCS21HJ-150	15PF	50V	CERAMIC	
C806	QCF21HP-473	0.047MF	50V	CERAMIC	
C807	QCF21HP-473	0.047MF	50V	CERAMIC	
C808	QCF21HP-473	0.047MF	50V	CERAMIC	
C809	QETB1CM-227	220MF	16V	ELECTRO	
C810	QETB1VM-107	100MF	35V	ELECTRO	
C811	QETB1HM-476	47MF	50V	ELECTRO	
C812	QETB1CM-476	47MF	16V	ELECTRO	
C813	QETB1HM-476	47MF	50V	ELECTRO	
C814	QCF21HP-473	0.047MF	50V	CERAMIC	
C815	QCF21HP-103	0.01MF	50V	CERAMIC	
C819	QFN81HJ-223	0.022MF	50V	MYLAR	
C820	QFN81HJ-473	0.047MF	50V	MYLAR	
C821	QETB1EM-106	10MF	25V	ELECTRO	
C822	QETB1HM-475	4.7MF	50V	ELECTRO	
C823	QETB1EM-106	10MF	25V	ELECTRO	
C824	QFN81HJ-333	0.033MF	50V	MYLAR	
C825	QFN81HJ-332	3300PF	50V	MYLAR	

RESISTORS

△	ITEM	PART NUMBER	DESCRIPTION		AREA
	R801	QRD148J-821S	820	1/4W	CARBON
	R802	QRD148J-103S	10K	1/4W	CARBON
	R803	QRD148J-103S	10K	1/4W	CARBON
	R804	QRD148J-104S	100K	1/4W	CARBON
	R805	QRD148J-472S	4.7K	1/4W	CARBON
	R806	QRD148J-102S	1K	1/4W	CARBON
	R807	QRD148J-473S	47K	1/4W	CARBON
	R808	QRD148J-221S	220	1/4W	CARBON
	R809	QRD148J-331S	330	1/4W	CARBON
	R810	QRD148J-683S	68K	1/4W	CARBON
	R811	QRD148J-221S	220	1/4W	CARBON
	R812	QRD148J-221S	220	1/4W	CARBON
	R813	QRD148J-221S	220	1/4W	CARBON
	R814	QRD148J-103S	10K	1/4W	CARBON
	R816	QRD148J-103S	10K	1/4W	CARBON
	R817	QRD148J-102S	1K	1/4W	CARBON
	R818	QRD148J-5R6S	5.6	1/4W	CARBON
	R820	QRD148J-104S	100K	1/4W	CARBON
	R821	QRD148J-102S	1K	1/4W	CARBON
	R822	QRD148J-331S	330	1/4W	CARBON
	R823	QRD148J-333S	33K	1/4W	CARBON
	RA801	QRB045J-473	47K		ARRAY
	RA802	QRB065J-103	10K		ARRAY
	RA803	QRB065J-103	10K		ARRAY

OTHERS

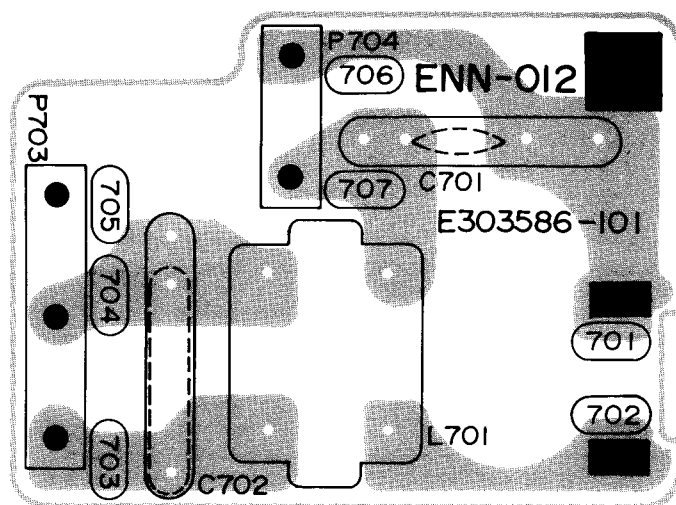
ITEM	PART NUMBER	DESCRIPTION	AREA
	EX0007005N60S	SPACER	
	E11171-001	CIRCUIT BOARD	
	E3400-366	FELT SPACER	
	E71504-001	SHIELD COVER	
L801	EQL2103-562	F.INDUCTOR	
FL801	ELU0001-027	F.L.TUBE	
P 801	QMV5005-005K	PULAG ASSY	
P 802	E04365-010	F.W.SOCKET	
P 803	E04365-005	F.W.SOCKET	
SW801	ESP0001-008	PUSH SWITCH	
SW302	ESP0001-008	PUSH SWITCH	
SW803	ESP0001-008	PUSH SWITCH	
SW804	ESP0001-008	PUSH SWITCH	
SW805	ESP0001-008	PUSH SWITCH	
SW806	ESP0001-008	PUSH SWITCH	
SW807	ESP0001-008	PUSH SWITCH	
SW808	ESP0001-008	PUSH SWITCH	
SW809	ESP0001-011	PUSH SWITCH	
SW810	ESP0001-011	PUSH SWITCH	
SW811	ESP0001-011	PUSH SWITCH	
SW812	ESP0001-011	PUSH SWITCH	
SW813	ESP0001-011	PUSH SWITCH	
SW814	ESP0001-011	PUSH SWITCH	
SW815	ESP0001-011	PUSH SWITCH	
SW816	ESP0001-011	PUSH SWITCH	
XT801	CSA4.00MG	CRYSTAL	
XT802	ECX4194-304CC	RESONATOR	

● ENN-012 ☐ Primary P.C. Board Ass'y

Note: ENN-012 ☐ Varies according to the areas employed. See note (1) when placing on order.

Note (1)

P.C. Board Ass'y	Designated Areas
ENN-012 ☐ A	U.S.A.
ENN-012 ☐ B	U.S. Military Market & other countries
ENN-012 ☐ C	Europe, Australia & Spain
ENN-012 ☐ DBS	U.K.
ENN-012 ☐ F	Canada



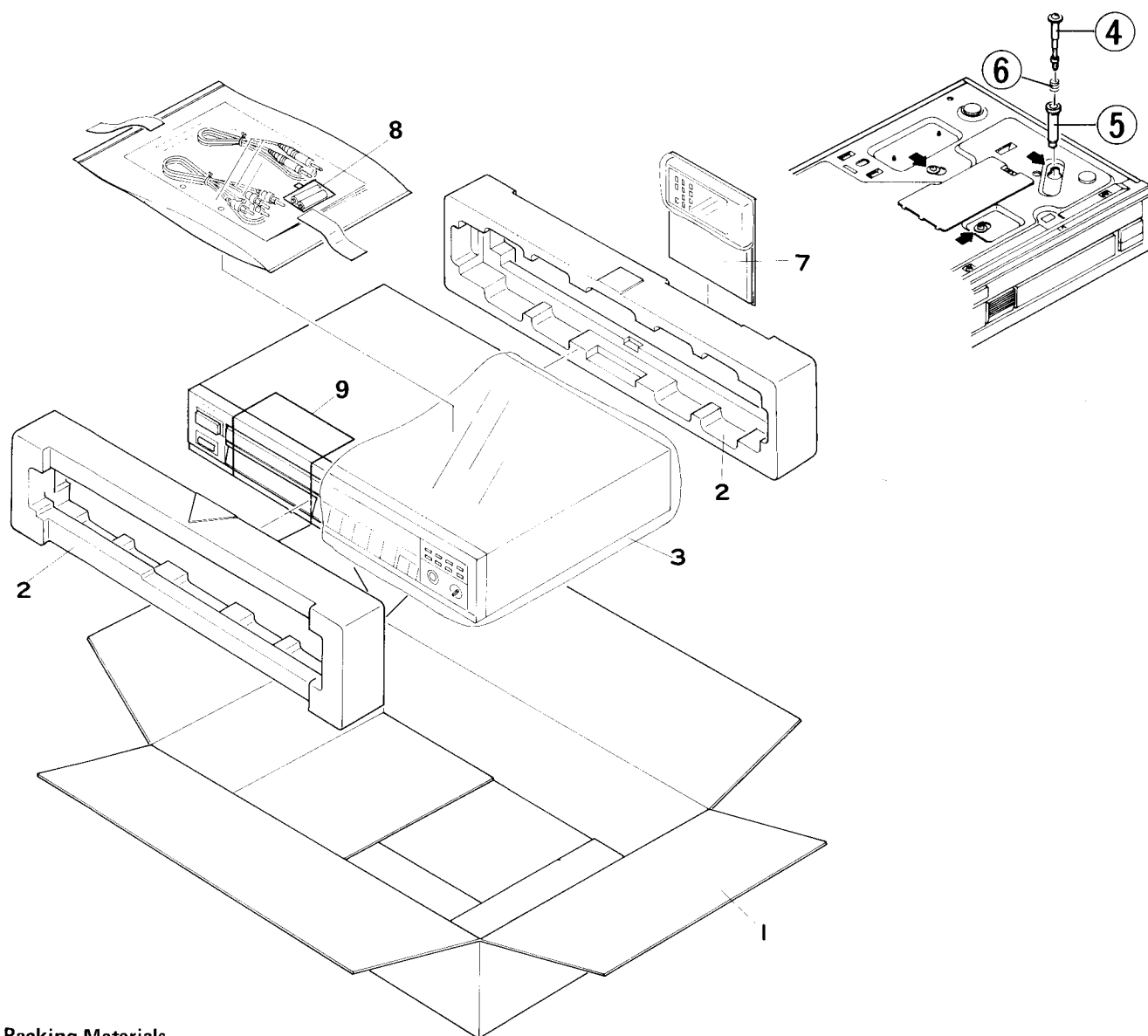
CAPACITORS

ITEM	PART NUMBER	DESCRIPTION	AREA
C701	QCZ9019-103	0.01MF CERAMIC	A
C701	QCZ9019-103	0.01MF CERAMIC	F
C701	QFZ9020-103	0.01MF MYLAR	B
C701	QFZ9020-103	0.01MF MYLAR	C
C701	QFZ9020-103BS	0.01MF MYLAR	DBS
C702	QFZ9010-223	0.022MF MYLAR	C
C702	QFZ9019-223	0.022MF MYLAR	A
C702	QFZ9019-223	0.022MF MYLAR	F
C702	QFZ9020-223	0.022MF MYLAR	B
C702	QFZ9020-223BS	0.022MF MYLAR	DBS

OTHERS

ITEM	PART NUMBER	DESCRIPTION	AREA
	E303586-101	CIRCUIT BOARD	A
	E303586-101	CIRCUIT BOARD	B
	E303586-101	CIRCUIT BOARD	C
	E303586-101	CIRCUIT BOARD	F
	E303586-101BS	CIRCUIT BOARD	DBS
L701	ENZ5002-003	LINE FILTER	A
L701	ENZ5002-003	LINE FILTER	B
L701	ENZ5002-003	LINE FILTER	C
L701	ENZ5002-003	LINE FILTER	F
L701	ENZ5002-003BS	LINE FILTER	DBS
T701	E65508-002	TAB	
T702	E65508-002	TAB	
T703	E67764-203	TERMINAL ASSY	
T704	E67764-202	R. TERMINAL	

Packing Materials and Parts List



Packing Materials

⚠	Item No.	Part Number	Part Name	Q'ty	Description	Areas
	1	PK-XLV400BE	Packing Case	1	E24872-007	Except ES
		PK-XLV400BES	Packing Case	1	E24872-008	ES
	2	NZ-XLV400BE	Packing Pad	1	E11197-003 (Front) E11197-004 (Rear)	
	3	E300196-047	Envelope	1		Except BS
		E300196-047B	Envelope	1		BS
	4	E72395-001	Screw	3		
	5	E72394-001	Spacer	3		
	6	E72396-001	Comp. Spring	3		
	7	E304027-001	Sheet	1		
	8	E41202-004	Envelope	1		
	9	E303871-002	Caution Sheet	1		

The Marks for Designated Areas

J	U.S.A.	ES	Spain
C	Canada	BS	U.K.
E	Europe	P, PG . . .	U.S. Military Market
A	Australia	U	Other Countries
G	West Germany	No mark indicates all areas.	

⚠ : Safety Parts

Accessories List

	Part Number	Part Name	Description	Areas
	E30580-1264A E30580-1264ABS RM-V400U UM-3(DJ)-2P BT20047C	Instruction Book Instruction Book Remote Control Battery Warranty Card		Except BS BS J, P, PG
	BT20025H BT20029C BT20060 BT20064 BT20046B	Warranty Card Warranty Card Warranty Card Warranty Card Service Information		C A BS G J, P, PG
	BT20044E BT20071A BT20066 E70570-001 E70571-001	Safety Instruction Sheet Service Center EEC Agency Keeping Card Keeping Card		J C BS, G J J
	E70572-001 A76332-2 E35497-017 E35497-019 E04056	Keeping Card Keeping Card Caution Sheet Caution Sheet Siemens Plug	110 V 220 V	J J P U, PG U, PG
	EWP805-001 EWP302-101 E66416-003 E41202-2 E41202-2B	1P Plug Cord Signal Cord Envelope Envelope Envelope		J Except BS BS

 : Safety Parts

The Marks for Designated Areas

J U.S.A.
 C Canada
 E Europe
 A Australia
 G West Germany
 ES Spain
 BS U.K.
 P, PG U.S. Military Market
 U Other Countries
 No mark indicates all areas.

17. Connection Diagram

